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## CHEMOTHERAPY BASED ON DRUG SENSITIVITY TESTS PERFORMED IN GENERAL PRACTICE.


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A MAJOR PROBLEM of the chemotherapeutic era continues to be the degree of empirical use of antibiotics forced upon or accepted by doctors, particularly those engaged in extrahospital practice. The disadvantages of indiscriminate chemotherapy which have been repeatedly stressed (Garrod, 1957; Gray, 1954) are, briefly, toxic and hypersensitivity reactions, the increasing incidence of bacterial resistance, superinfection and the high cost of many drugs.

Hospitals rely upon laboratory drug sensitivity tests to provide an indication of the bacterial sensitivity to be expected in the treatment of clinical infections, and by these means may maintain reasonable control over chemotherapy; for example, one of Melbourne's largest teaching hospitals conducts 100 to 150 such tests each week. However, it appears that the concern felt by the house surgeon confronted by an infection (because of the severity of the infection and the anticipated delay of approximately 48 hours in the provision of the result of the test requested) leads frequently to empirical drug selection. The correct choice of drug is highly desirable and can be achieved, in all but fulminating infections, by withholding chemotherapy pending the report, which can be provided as early as six or eight hours after the receipt of the specimen.

The general practitioner is, generally speaking, less fortunately placed. Presented with a case warranting chemotherapy, he is faced with several alternatives. He may empirically select a drug, adopt an expectant attitude and change the drug as soon as its failure to affect the condition becomes apparent. He may send specimens from his patients to hospital laboratories, but inquiry reveals that this is not his usual practice, while the Public Health Laboratory of Victoria is seldom called upon to perform more than a dozen such tests each week. Finally, he may utilize the services of a private pathologist, either by sending a specimen or referring his patient. While it is believed that the majority of drug sensitivity tests made in private practice are done in this way, it seems that in very many cases tests are dispensed with altogether, either because the practitioner regards them as a desirable but impracticable luxury, and most inconvenient for his patient if he has to be referred, or because a possible delay of two or even three days introduces too many

difficulties. There may, of course, be no approved laboratory reasonably accessible to supply the service he requires.

When the possibility of general practitioners carrying out their own tests was first suggested by one of us, there were several immediate and relevant theoretical objections: (*a*) few practitioners would have much confidence in their ability to cope with bacteriological techniques; (*b*) blood agar plates are not readily available, and if they were, could not be stored, even in a refrigerator, for more than two weeks; (*c*) the interpretation of the test requires a certain amount of experience; (*d*) the tests are time-consuming. If it was possible to overcome the chief difficulty—that of providing a medium which could be stored indefinitely at room temperature and made available for use easily, and if necessary, at short notice—it was believed that the other matters would take care of themselves. The present paper reports the results of an experiment involving 17 medical and two dental practitioners engaged in single or group practices scattered through the Melbourne metropolis, who were supplied with a "do it yourself" kit and a simple technique which appeared to answer the foregoing objections.

## Materials and Methods.

The kit[1] consisted of the following items: (*a*) sterile plastic Petri dishes, packed in "Polythene" in packets of six;[2] (*b*) sterile plain wool swabs; (*c*) yeast extract agar[3] in 1 oz. screw-capped bottles (15 ml. quantities); (*d*) horse blood agar plates (controls on the suitability of yeast extract agar); (*e*) "Sentest Discs"; (*f*) a suitable incubator;[4] (*g*) grease pencil; (*h*) report forms.

The plastic Petri dishes were supplied already sterilized by ethylene oxide gas in a pack that could be opened aseptically for the required number of plates to be withdrawn, without contamination of the remainder. Whole or reclosed packs keep indefinitely at room temperature.

### *Culture Media.*

Preliminary laboratory experiments showed the yeast extract agar to be the medium of choice, as it possesses most, if not all, the nutrients present in blood agar, but, unlike the latter, it can be stored indefinitely in bottles at room temperature. Pigment production by bacteria is more easily observed on this medium, and colonies may be considerably larger than those on horse blood agar (Figure I). Inability to demonstrate hæmolysis is not considered a great disadvantage, as the professed aim was to determine the drug sensitivity pattern rather than the identity of the organism. Bottles could be melted for plates to be poured once a week or as required. Simple aseptic precautions, including flaming the neck of the bottle before pouring, were sufficient to minimize contamination of the plates, and once poured they could be refrigerated in the "Polythene" containers for up to two weeks. It is worth noting that unwrapped plates of any medium lose moisture at the rate of approximately 10% per week even under refrigeration, and therefore have a limited lifespan. Horse blood agar plates were supplied fresh each week as a control on the efficiency of the yeast extract agar medium in the survey. The chemotherapeutic agents selected were sulphonamide, penicillin, tetracycline, chloramphenicol, erythromycin and streptomycin, with the addition of nitrofurantoin for urine examination.

### *Incubators.*

The provision of an efficient but inexpensive means of incubating a small number of plates at 37° C. was a major consideration. In seeking types that would be reasonably priced and suitable for the purpose we found the "Incubaril" (Figure III) available commercially and very suitable. Enough successful work was also done with a smaller and cheaper experimental model, cylindrical in design and holding four to six plates, to warrant its commercial production if the demand was sufficiently great (Figure IV).

### *Recommended Procedure.*

Practitioners were advised to restrict their observations as far as possible to situations in which there was unlikely to be gross contamination by normal bacterial flora or secondary contaminants, but it was pointed out that even in these cases complete bacterial inhibition would often allow selection of a suitable drug. Specimens might include discharges, swabbings of the results of surgical incision or aspiration, urine and so on. With the aid of a sterile swabstick the specimen was sown as a lawn culture, with continuous light cross-hatching and rolling of the swab to ensure uniform inoculation, on to each of two plates, one each of yeast extract agar and horse blood agar. The antibacterial drugs in the form of "Sentest" discs were then applied in a predetermined pattern with flamed forceps and their positions were marked with a grease pencil on the under surface of the plate. The plates were incubated

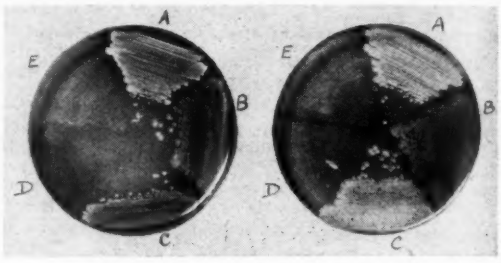


FIGURE I: Eighteen-hour cultures of common pathogens showing comparative growth rates on horse blood agar (left) and yeast extract agar (right). A. = *Staphylococcus pyogenes*; B. = *Pseudomonas pyocyanea*; C. = *Escherichia coli*; D. = *Streptococcus pyogenes*; E. = *Streptococcus fæcalis.*

aerobically at 37° C. and observed thereafter for zones of inhibition of the otherwise continuous growth across the surface of the plate (Figure V). By referring to these zones of inhibition the practitioners selected the appropriate antibiotic, occasionally combining topical with systemic administration, when the nature of the lesion indicated that this might be profitable.

Plates were later forwarded to the laboratory, together with case records, for confirmation of the practitioner's interpretation and for identification of the organisms present. The records, made on cyclostyled sheets, indicated in each case the clinical diagnosis, the method of obtaining the specimen and the macroscopic characteristics of the growth, cultures on the two media being compared. The interpretation of the drug sensitivity pattern, and in some cases the minimum time required to read it, were recorded, although in practice cultures were often put up in the evening and not observed until the following morning. Doctors were asked to record the drug or drugs selected, the systemic and topical treatment as well as accessory measures adopted, and the clinical results in each case, before sending the plates to the laboratory for confirmatory examination.

## Results.

The results far exceeded early expectations. Enthusiasm for the experiment increased greatly as the possibilities of the tests became apparent to the participants. Within a few weeks the plates sent to the laboratory were of professional standard, and in many cases the organisms were being correctly named on the macroscopic appearance of the culture. On this point it may be said that if this test was to become generally adopted, there is no reason why the limited number of pathogens met with in clinical practice should not be identifiable with reasonable certainty when the central laboratory is no longer regularly referred to by the practitioner. It would be an easy matter for the practitioner to supplement his naked-eye diagnosis by examining a stained smear. It will, of course, be quite clear that the technique employed in an experiment involving only aerobic incubation

[1] A suitable kit for use of the practitioners (Figure II) is available from Evans Medical Australia (Pty.) Ltd.

[2] Plastic Petri dishes were supplied by Tuta Products, Collingwood, Victoria.

[3] Yeast extract agar was prepared as follows. In distilled water (100 ml.) were dissolved "Bonox" (1%), "Evans" peptone (1%), sodium chloride (0·5%) and "Difco" yeast extract (0·5%) by steaming. The pH was adjusted to 8·4 and the mixture was steamed for one hour. After it had been filtered, "Davis" agar (1·25%) was added and dissolved by steaming. The pH was adjusted to 7·2-7·4 and the mixture was sterilized at 15 lb. pressure for 15 minutes.

[4] "Incubarils" were obtained from H. B. Selby and Ramsay Surgical (Melbourne).

excluded anaerobes such as anaerobic streptococci, gas gangrene and tetanus organisms and actinomyces; it would also probably fail to reveal the majority of pathogenic yeasts and fungi, but *Candida albicans* and *Aspergillus niger* might be expected to appear after 48 hours' incubation under these conditions. In so far as the recognition of all these organisms requires specialist attention in any case, this is not to be regarded as a contraindication to the general adoption of the procedure.

Fifteen of 139 case records submitted were discarded because of early difficulties in technique, excessive drying of the plates before being forwarded to the laboratory and streptococci, and also to the incidence of viral disorders.

*Miscellaneous Infections.*—Details of miscellaneous infections, consisting of nine acute or recurrent urinary tract infections in females, one appendiceal abscess and one gastro-intestinal infection, are set out in Table III. From six of the nine urinary tract infections *E. coli* was isolated, while the appendiceal abscess yielded *Staph. pyogenes* as well as *E. coli*. *Staph. pyogenes* was isolated from fæcal culture in the case of the gastro-intestinal infection, but its significance in this situation was problematical.

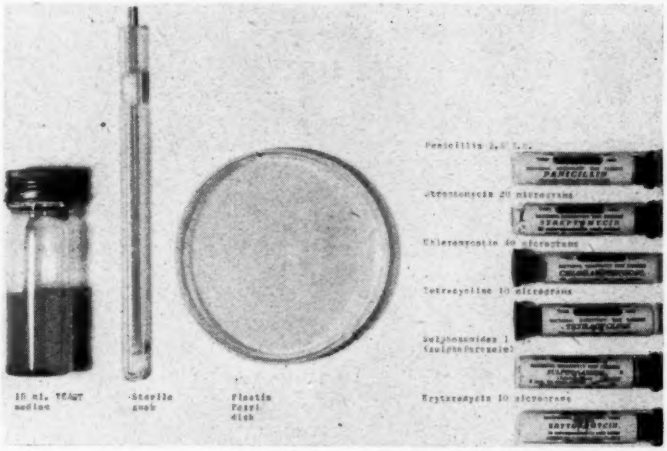

FIGURE II: Standard kit as supplied for drug sensitivity tests in private practice.

for confirmation of findings, or failure to obtain the results of treatment. In Tables I to V are reported and analysed relevant aspects of the remaining 124 case histories.

*Relation of Bacteriological Findings to Clinical States.*

*Skin Conditions.*—Table I presents a summary of the results obtained from a broad group of conditions presumed to have originated as cutaneous infections. Of specimens from 83 cases, six failed to produce any growth (this is partly explainable by early inexperience), 60 yielded *Staphylococcus pyogenes* and eight yielded *Streptococcus pyogenes*, while *Escherichia coli*, *Pseudomonas pyocyanea*, *Proteus* and *Streptococcus fæcalis* were occasionally found. It should be noted that several cases showed mixed flora, of which some were undoubtedly of secondary or extraneous origin. In those cases, as far as possible, a drug was selected that was active against the entire growth on the plate.

*Infections of the Mouth or Naso-Pharynx.*—It was not easy to decide what advice to give to practitioners concerning infections involving areas where the extensive normal bacterial population will largely grow on any culture plate. However, some elected to include such areas, and though the results were equivocal in many cases, it was often found that a drug inhibiting normal flora as well as potential pathogens might usefully be employed, and so we have included these findings in Table II. It will be observed that staphylococcal and streptococcal infections predominated, with *Pseudomonas* again being found in infections of the auditory canal. With yeast extract agar medium it is held that recognition of a streptococcal infection or carrier state may be difficult and that doctors may need to seek specialist advice in these cases. It is pointed out that, even in the laboratory, many specimens from upper respiratory infections fail to yield a satisfactory bacteriological picture, owing in part to normal carrier rates of pathogenic staphylococci

*The Drug Sensitivity Patterns of Bacteria Isolated in General Practice.*

Table IV indicates the sensitivity patterns of staphylococci to the drugs tested. An interesting feature was

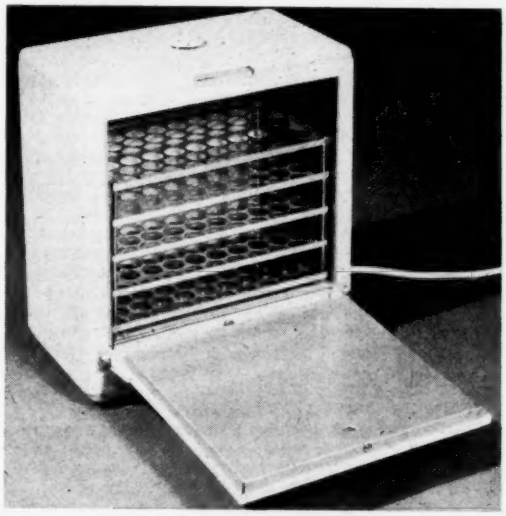

FIGURE III: "Incubaril" apparatus (H. B. Selby and Ramsay Surgical, Melbourne).

the small proportion of penicillin-sensitive staphylococci (26%); this was lower than the figure of 36% found in

1958 in a general practice survey by Johnson, Rountree, Smith, Stanley and Anderson 1960). In the assessment of these results, it should be noted, despite the temptation to postulate a deterioration during the intervening three years, that figures from the present series are small, and the population was urban and suburban. It is heartening to see that, in this sample of staphylococci currently associated with the type of infection considered, the organisms were usually sensitive to the tetracycline group of drugs, and predominantly sensitive to streptomycin, while none showed resistance to either chloramphenicol or erythromycin.

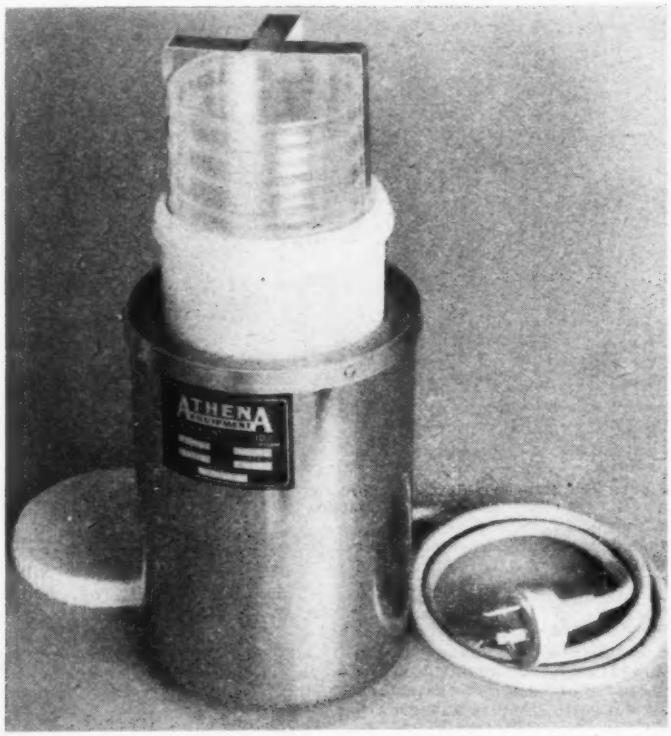


FIGURE IV: Alternative incubator.

The incidence of multiple resistance of staphylococci was determined in 67 strains tested against all six of the drugs indicated in Table IV. Thirteen strains were resistant to none of the six; 33 strains were resistant to one drug out of six (30 to penicillin only and three to sulphonamide only); 14 were resistant to two drugs (eight to penicillin and sulphonamide, and six to penicillin and tetracycline); six were resistant to three drugs (four to penicillin, sulphonamide and tetracycline, and two to penicillin, sulphonamide and streptomycin); one was resistant to all except chloramphenicol and erythromycin; none was resistant to more than four of the six drugs.

*Treatment Adopted and Results of Treatment.*

It is self-evident that chemotherapy was not warranted in a number of cases, while accessory methods, such as topical applications and incision, were used in others. When chemotherapy was used systemically, drug selection in practically every instance was directly determined by the result of the drug sensitivity test.

*Furunculosis and Allied Conditions.*—Of 24 cases of furunculosis tetracycline was the drug of choice in 12; penicillin was used in two; erythromycin was used in one and chloramphenicol was used in four. Incision was used in three. "Soframycin" was used alone topically in three, and it also was used to eradicate nasal staphylococci in one. The result in all cases was satisfactory. Of four carbuncles treated, streptomycin was chosen in two cases, tetracycline in one and sulphonamide in one. Incision was used in three cases. The results were good except for one man who died of heat stroke and senility after 24 hours on sulphonamide therapy.

*Impetigo and Staphylococcal Skin Rash.*—Two patients with staphylococcal skin rash responded well, one to chloramphenicol given systemically and one to "Soframycin" topically applied. Impetigo was treated satisfactorily with ammoniated mercury ointment (two cases) and with tetracycline (one case).

*Infections of the Digits, the Hand and the Foot.*—Five patients with infected fingers were treated with good results, one with penicillin by mouth, two with tetracycline (with, additionally, chloramphenicol in one case), one with chloramphenicol and one with streptomycin. Incision was employed also once. One infected hand was treated with tetracycline and another with streptomycin, but, while both conditions were relieved, the latter recurred three weeks later. Infection in the foot was treated once with tetracycline and once with sulphonamide, successfully in both cases.

*Paronychia.*—Paronychia was treated by incision only in two cases, by incision and penicillin given systemically, in one case, and by removal of the nail, "Soframycin" applied topically and chloramphenicol given orally in one case—all with satisfactory results.

*Cellulitis and Lymphangitis.*—Cellulitis and/or lymphangitis was treated satisfactorily thus: with penicillin in one case, with penicillin and sulphonamide in one case, with tetracycline in one case and with chloramphenicol and erythromycin in one case.

*Infected Burns, Wounds and Abrasions.*—One patient suffering from an infected burn was given tetracycline by mouth. Eight patients with infected wounds or abrasions were treated with rest alone in two cases, with eusol applied topically alone in one case, with penicillin given systemically in one case, with penicillin given systemically and eusol applied topically in one case, with tetracycline in two cases and with chloramphenicol in one case. All the conditions resolved satisfactorily, except that an infected

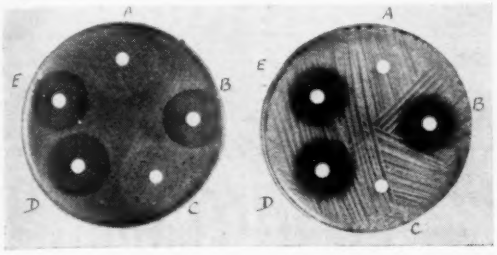


FIGURE V: Results of drug sensitivity test on *Staphylococcus pyogenes*, comparing cultures on horse blood agar (left) and yeast extract agar (right). A. = penicillin (2·5 I.U.); B. = "Chloromycetin" (40 μg.); C. = streptomycin (20 μg.); D. = erythromycin (10 μg.); E. = tetracycline (10 μg.).

foot wound later required excision for chronic sinus formation, the bacteriological flora not being determined.

*Tonsillitis, Pharyngitis, Infections of Dental Origin and Oral Ulcers.*—Ten patients with acute tonsillitis were treated successfully with penicillin in five cases, penicillin and sulphonamide in three cases, sulphonamide in one case and tetracycline in one case. A good response was obtained in the case of an "infected throat" with tetracycline. Of two patients with oral ulcers included in the survey, one, who was receiving tyrothricin lozenges, failed to improve, while another, treated with Mandl's paint, was cured. One patient with a dental pulp infection yielding no pathogens was treated topically with an antibiotic preparation containing neomycin, bacitracin and polymyxin. One patient with a large periodontal abscess was treated satisfactorily, if somewhat heroically, by combined systemic therapy (streptomycin, penicillin and erythromycin) and incision. One patient with a tooth socket infection following a tooth extraction responded very well to tetracycline, while one submandibular abscess subsided with erythromycin treatment.

*Otitis Media, Sinusitis and Nasal Discharge.*—Of 11 cases of otitis media two were satisfactorily treated with penicillin, two with penicillin and sulphonamides, three with tetracycline, one with tetracycline and chloramphenicol, two with chloramphenicol and one with chloramphenicol combined with streptomycin. In two cases in which organisms sensitive to chloramphenicol were concerned, this was given orally and also applied topically. Most otitis media cases were listed as acute. One patient with acute sinusitis whose culture produced no growth did well on penicillin. Two patients with nasal discharge received tetracycline (in one case with "Soframycin" applied topically) with good results.

*Otitis Externa.*—Eleven patients with acute, chronic or recurrent otitis externa were treated, all with good results. Streptomycin was used in three cases (with "Terramycin" in one case), penicillin in three (with sulphonamides in one), chloramphenicol in two and "Furadantin" in one. Antihistamines only were used in one case. Chloramphenicol ear drops were used in four cases and neomycin drops in one case.

*Urinary Tract Infections.*—Nine patients with urinary tract infections were treated successfully; all these patients were females, and most had acute pyelocystitis. Chloramphenicol was used in three cases, nitrofurantoin in three cases and sulphonamides in two. One patient went interstate before her treatment commenced.

*Miscellaneous.*—One patient with an appendiceal abscess treated by appendicectomy and chloramphenicol, after an initial rapid improvement, subsequently developed wound infection. One breast abscess, from which no bacteria were isolated, healed without antibiotic therapy. One pilonidal sinus, also yielding no growth on culture, was not treated, while another, excised after pre-operative treatment with tetracycline, healed by first intention. Two staphylococcal perineal abscesses were treated satisfactorily with incision, aided respectively by tetracycline and streptomycin.

## Discussion.

The present investigation has shown that drug sensitivity tests in group or single practices are both possible and practicable. The equipment required is inexpensive; supplies of the necessary materials could readily be made available; a test can be set up quickly, and is within the scope of a nurse's everyday duties. It is easily interpreted, and in cases of urgency an answer has been available as early as four hours after the taking of the specimen. The doctors participating agreed unanimously that the equipment, the time and the technical skill required in setting up the tests and interpreting the results were less than they had anticipated, and all were impressed with the relative significance of a profuse or scanty growth of organisms on the plates as an indication of the presence of large or small numbers of organisms respectively in the lesion under consideration. One important finding was that, although identification of the causative organ was of secondary importance, especially when it was present in purity, several participants soon began to recognize staphylococcus and pseudomonas on gross cultural appearances. The half dozen common pathogens encountered would soon become familiar to the doctor, particularly if he set about initially to confirm his naked-eye impression by microscopy.

As most doctors these days consider a small refrigerator a necessary part of their equipment, the problem of storing a week's supply of poured yearst extract agar plates hardly arises (four to eight would meet the requirements of two or three doctors and these could be stored in the original "Polythene" bags until required). The present investigation shows that horse blood agar, a traditional medium for pathogenic organisms, but one that cannot be stored for more than 10 to 14 days even in the refrigerator, is not superior in any significant way to yeast extract agar for drug sensitivity tests of the type carried out in the present survey. As yeast extract agar can be stored indefinitely at room temperature in bottles, each sufficient to make one plate, it overcomes the major difficulty confronting practitioner tests. For busy practices bottles containing sufficient medium to pour six plates could also be provided. Supplies of antibiotic test discs are readily available, and several manufacturers are supplying dispensers which will deliver the whole range of discs on to the seeded culture plate in one operation. With this method, a specimen can be collected, a lawn plate sown, the discs planted on it and the plate labelled for incubation all within a few minutes. Successful readings can be made usually between six and 18 hours later.

The cheapest incubator at present available, and that used by all but two participants (Figure III) can be purchased for just under £30. This model is larger than is needed even by a large group practice, and the authors have successfully experimented with a small cylindrical model capable of holding six plates, which could be produced for perhaps £20, depending on demand. Moreover, it is noteworthy that apart from initial outlay, running costs associated with the tests are low, and that the Commonwealth benefit for this item allows the patient to accept the advantages of the test at a very small net cost.

TABLE I.
*The Æetiology of 83 Infections of the Skin.*

| Clinical Diagnosis. | Number of Cases. | Organisms Isolated. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | *Staph. pyogenes.* | *Strep. pyogenes.* | *E. coli.* | *Ps. pyocyanea.* | *Strep. fæcalis.* | *Proteus.* | No Pathogens Detected. | No Growth. |
| Infected finger, hand or foot .. | 10 | 9 | 2 | 1 | — | — | — | — | — |
| Infected wound, burn or abrasion | 8[1] | 3 | 2 | 2 | — | — | 1 | 1 | — |
| Impetigo or "staphylococcal infections of the skin" .. .. | 6 | 5 | 2 | — | — | — | — | — | 1 |
| Furunculosis (single, multiple or recurrent) .. .. .. .. | 24 | 22 | 1 | — | — | — | — | — | 1 |
| Carbuncle .. .. .. .. | 4 | 4 | — | — | — | — | 1 | — | — |
| Recurrent axillary abscess .. | 1 | 1 | — | — | — | — | — | — | — |
| Paronychia (acute or chronic) .. | 5[1] | 1 | — | 1 | — | — | — | 1 | 2 |
| Cellulitis, lymphangitis .. .. | 4 | 3 | 1 | — | — | — | — | — | — |
| Infected sebaceous cyst .. .. | 1 | 1 | — | — | — | — | — | — | — |
| Perineal abscess .. .. .. | 2 | 2 | — | — | — | — | — | — | — |
| Breast abscess .. .. .. | 1 | — | — | — | — | — | — | — | 1 |
| Pilonidal sinus .. .. .. | 2 | — | — | — | — | 1 | — | — | 1 |
| Recurrent hordeola or infected Meibomian cyst .. .. .. | 3 | 3 | — | — | — | — | — | — | — |
| Otitis externa (acute or recurrent chronic) .. .. .. .. | 12[1] | 6 | — | — | 3 | — | 1 | 3 | — |
| Total .. .. .. | 83 | 60 | 8 | 4 | 3 | 1 | 3 | 5 | 6 |

[1] This discrepancy between the numbers of cases and of organisms is accounted for by occasional mixed infections (90 organisms were isolated from 83 cases).

Plate disposal needs consideration. In the present experiment all cultures were forwarded for checking to the laboratory where they were later autoclaved. Those practices which have their own "D.S.L." autoclaves[5] would have no problem. Others would need to rely on incineration or chemical disinfection (for example, several hours in 2% "Lysol" solution). The type of test recommended is a direct one on the culture sown from the specimen without any attempt at preliminary purification. Not only is preliminary purification unnecessary for the doctor to obtain the information he needs in order to commence specific treatment, but it wastes a full 18 to 24 hours.

The supreme advantage of the suggested procedure is that it will minimize that major abuse of chemotherapy, the futile and indefensible administration of a drug lacking activity against the causative organism. In those cases of great urgency in which empirical treatment is deemed necessary, it may well be known in four hours whether the choice has been the correct one. The saving in the doctor's time, the convenience to the patient, the avoidance of unnecessary exposure of people to the possible hypersensitizing action of antibiotics and of case- or carrier-borne pathogens to the antibiotic-impregnated environment which selects drug-resistant mutants—these facts must all be given due weight in assessing the implications of the proposals submitted here.

It may well be asked: "What are the limitations of the procedure?" Obviously there are limitations. It is clear, for example, that a more specialized approach is required for investigating throat, nasal and sinus infec-

[5] E. A. Atherton & Sons Pty. Ltd., Melbourne.

TABLE II.
*The Bacteriology of Infections Arising in the Mouth or Nasopharynx.*

| Clinica Diagnosis. | Number of Cases. | *Staph. pyogenes.* | *Strep. pyogenes.* | *E. coli.* | *Ps. pyocyanea.* | *Strep. fæcalis.* | No Pathogens Detected. | No Growth. |
|---|---|---|---|---|---|---|---|---|
| Acute tonsillitis or pharyngitis | 11 | 3 | 3 | — | — | — | 6 | — |
| Suppurative otitis media .. | 11 | 6 | 1 | 1 | 2 | 1 | — | — |
| Nasal discharge .. .. .. | 2 | 2 | — | — | — | — | — | — |
| Sinusitis .. .. .. .. | 1 | — | — | — | — | — | — | 1 |
| Oral ulcers .. .. .. | 2 | 1 | — | — | — | — | 1 | — |
| Infected tooth socket after extraction .. .. .. | 1 | 1 | — | — | — | — | — | — |
| Periodontal abscess .. .. | 1 | — | 1 | — | — | — | — | — |
| Chronic dental pulp infection .. | 1 | — | — | — | — | — | — | 1 |
| Submandibular abscess .. .. | 1 | 1 | — | — | — | — | — | — |
| Total .. .. .. | 31 | 12 | 7 | 1 | 2 | 1 | 7 | 2 |

tions. Similarly, bacteriological investigation of other regions with a complex normal flora (for example, the alimentary, the lower part of the respiratory and the female genital tracts) would broadly seem to fall outside the simple laboratory procedures recommended for the general practitioner. The infections eminently suited for the test are numerous. As a rule, a single furuncle, for example, would not warrant systemic treatment, but a furuncle on the "danger area" of the face, carrying with

TABLE III.
*The Bacteriology of Miscellaneous Infections.*

| Clinical Diagnosis. | Number of Cases. | Organism. | | | |
|---|---|---|---|---|---|
| | | *Staph. pyogenes.* | *E. coli.* | *Strep. faecalis.* | Contaminants. |
| Urinary tract infection .. .. | 9 | — | 6 | — | 3 |
| Appendiceal abscess | 1 | 1 | 1 | — | — |
| Infective diarrhœa.. | 1 | 1 | — | 1 | — |

it the risk of cavernous sinus thrombosis, and multiple or recurrent furuncles are definite indications for a full course of chemotherapy. The difficulties of eradicating recurrent staphylococcal infections, and the importance of the nasal and skin carrier state in the patient and/or near contacts, should be clearly recognized. The importance of this problem is well illustrated by the following

TABLE IV.
*Drug Sensitivity of Pathogenic Staphylococci.*

| Drug Tested. | Number of Sensitive Strains of Staphylococci. | Number of Resistant Strains of Staphylococci. | Number Not Tested. | Sensitivity Rate. |
|---|---|---|---|---|
| Penicillin .. .. | 19 | 55 | — | 26% |
| Streptomycin .. | 67 | 3 | 4 | 96% |
| Sulphonamide .. | 47 | 22 | 5 | 69% |
| Tetracycline .. .. | 56 | 14 | 4 | 79% |
| Chloramphenicol .. | 71 | 0 | 3 | 100% |
| Erythromycin .. | 72 | 0 | 2 | 100% |

example. One practitioner had under his care a family, several members of which had intractable recurring staphylococcal infections over many months, until finally one son succumbed within two days to staphylococcal septicæmia and meningitis (without any evidence of superficial infection). Carbuncles, infected hands and digits, lymphangitis, lymphadenitis and cellulitis of various regions (particularly in the scalp, where subepicranial infection requiring urgent treatment is easily overlooked), are all conditions in which a properly selected, full course of chemotherapy may be justified (or essential). That external otitis, too, often responds dramatically to the correct antibiotic was shown in the present survey. One practitioner achieved fame in the eyes of his patient, and great personal satisfaction, by curing a very intractable recurring external otitis as a result of the test. Pyogenic infections of dental origin, suppurative otitis media, urinary tract or urethral infections and infected wounds lend themselves equally well to the tests.

The doctor naturally must first decide whether the condition warrants systemic chemotherapy. Impetigo, staphylococcal skin infections, infected abrasions and infected, confined superficial burns do not usually need antibiotics given systemically; the combinations in powder form of those antibiotics retained specifically for topical application (for example, polymyxin, neomycin and bacitracin) are usually admirable for this purpose. At this point, the authors would also recommend the more widespread use of these preparations (which do not possess the disadvantages already mentioned on the subject of indiscriminate use of systemic chemotherapy) for preventing the establishment of infection in contaminated wounds, as well as in minor surgical procedures (such as excision of ganglia), when disastrous results may follow unexpected infection.

A few attempts have been made in this experiment and elsewhere by one of the authors (on a limited number of cases as yet) to advance specific therapy even further by aspirating inflammatory fluid with a sterile syringe and needle from areas of cellulitis, or from infected operation wounds from which overt discharge cannot be expected for some days. Further work is indicated on this important aspect, as by these means it should be possible to speed up correct antibiotic therapy by several days, particularly in infections in which speed is likely to be of prime importance.

The general adoption of "do it yourself" drug sensitivity tests would certainly increase the specific use of chemotherapeutic agents in general practice. It would also reduce the far too common tendency to adopt their empirical use, particularly in multiple combination, with all its undesirable consequences. However, it would not reduce the responsibility of practitioners to select antibiotics rationally and to be wary of the masking effect which antibiotics may have in some important infections, when, because of inadequate dosage or premature withdrawal, complete control of the infection is not achieved. Outstanding examples are infections of the hand spreading to tendon sheaths or palm spaces, and penetrating wounds possibly involving joints. Chemotherapy, adequately administered as well as selected, should be regarded as an adjunct to and not a substitute for established surgical principles, such as adequate rest or incision (at the optimal time), and these principles must never be allowed to subside into the realm of forgotten things.

Finally, the participants in the experiment have found it an interesting and rewarding experience. They have felt the enormous potential advantage of being able to give better treatment as well as being in a position to make significant contributions to epidemiological research.

## Summary.

1. A field experiment conducted by practitioners with no special knowledge of bacteriology, designed to demonstrate the practicability and value of bacterial drug sensitivity tests in general practice, is described.

2. The technical equipment and modest skills required are outlined.

3. The results of the tests are given; they provide a limited indication of the drug sensitivity patterns of pathogens commonly found in clinical infections coming within the range of extrahospital care in urban and suburban practice in Melbourne.

4. The results of treatment selected as a result of the tests are set out.

5. The limitations of and the indication for the tests are discussed.

6. A plea is made for circumspection in the general use of chemotherapeutic agents.

## Acknowledgements.

The authors wish to express their appreciation of the work done and the enthusiasm shown by the participants in the experiment—namely, Dr. N. E. Carson, Dr. J. S. Collings, Dr. E. P. Cordner, Dr. R. L. Dickinson, Dr. G. A. Eagle, Dr. K. N. Grigg, Dr. A. D. Grounds, Dr. R. G. Henry, Dr. H. L. Indian, Dr. J. D. Livingston, Dr. D. J. Lynch, Dr. L. H. Lanyon, Dr. W. R. Rogerson, Dr. R. S. Smibert, Dr. M. Thwaites and Dr. R. Wyatt, and Mr. J. Austwick and Mr. I. R. Hanson (dental surgeons).

The loan of four "Incubarils" from H. B. Selby and Co., and from W. Ramsay (Surgical) Ltd., is gratefully acknowledged.

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## BLOOD ALCOHOL LEVELS IN ADULT PATIENTS ADMITTED TO HOSPITAL AFTER ROAD TRAFFIC ACCIDENTS.


By M. R. EWING, M.B., F.R.A.C.S., AND A. R. FOX, M.Sc.,
*The Department of Surgery, University of Melbourne.*


IT is evident that there has been, within recent times, an awakening of the public conscience in relation to the possible role of alcohol as a cause of accidents on our roads. At the same time, it has become clearly apparent that there is a striking lack of factual information on this point. In an endeavour to collect some data relating to this question, some time ago we instituted a study of the blood-alcohol levels of patients suffering from injuries received in road traffic accidents admitted to the adult wards of one of the large public hospitals in Melbourne.

Since it was important that this inquiry should in no way compromise our patients in the eyes of the law, it was conducted on an anonymous basis. The samples were identified only by a date and by a system of coloured labels, which signified the sex and whether the subject was driver, passenger or pedestrian. The definition "pedestrian" was strictly confined to those on foot; a cyclist or motor-cyclist was included in the "driver" group.

From the blood sample, taken as a routine procedure on the patient's admission for the determination of his blood group and hæmoglobin value, an aliquot was set aside for the determination of the blood-alcohol level.

Blood samples were analysed by the method of Kozelka and Hine (1941), which Dr. N. E. W. McCallum, of the Laboratory of Forensic Science in the Department of Pathology, University of Melbourne, had found to be "the most accurate and reliable" (McCallum *et alii*, 1959). Each batch of samples was monitored by running a "blank", and the results (expressed in milligrammes per 100 ml. of blood) could be duplicated to within 0·005%.

The inquiry was conducted over a period of one year. During this period 622 patients were admitted to the adult wards of the hospital with injuries received in road accidents, but for a variety of reasons it was possible to obtain a sample from only 173 of this number. Although we suspect that the chief reason for omission of this procedure was the large number of calls on the personnel of the casualty department during peak accident periods, we cannot claim to know, with any assurance, what determined the process of selection. It is possible that samples were taken most frequently where there was some reason to doubt the patient's sobriety.

The time at which the blood sample was taken in relation to the time of the accident was not determined. In many instances, several hours might have elapsed while the patient was being transported to hospital and before a decision had been made concerning the need for admission, often after a time-consuming radiological investigation.

A summary of the results is set out in Table I.

### Discussion.

This cannot be considered as more than a pilot survey, and the numbers in the various groups are not sufficiently large to allow one to make any firm deductions from them. It must also be recognized that this survey may by the process of selection be exaggerating materially the true state of affairs. In considering these figures, it is also important to recognize that it is highly likely that the blood-alcohol level at the time of sampling was very substantially lower than that which prevailed at the time of the accident. The reverse happening we believe to be unlikely. Since the accuracy of the method is 0·005%, any sample which, on analysis, contained 0·005% of alcohol or less we considered could fairly be described as "free from alcohol".

Of the total of 173 samples, 62, or rather more than one-third, fell into this category.

TABLE I.

| Subjects. | Milligrammes of Alcohol per 100 ml. of Blood. | | | | | |
|---|---|---|---|---|---|---|
| | 0·000 to 0·005. | 0·006 to 0·05 | 0·06 to 0·095. | 0·1 to 0·145. | 0·15 and Over. | Total. |
| Male drivers .. .. | 21 | 18 | 3 | 2 | 12 | 56 |
| Female drivers .. | 4 | 5 | Nil | 1 | Nil | 10 |
| Male passengers .. | 10 | 9 | 3 | 4 | 5 | 31 |
| Female passengers .. | 3 | 8 | 2 | 2 | 1 | 16 |
| Male pedestrians .. | 12 | 11 | 2 | 3 | 8 | 36 |
| Female pedestrians | 12 | 8 | 1 | 3 | Nil | 24 |
| Total .. | 62 | 59 | 11 | 15 | 26 | 173 |

*Male Drivers.*

It will be seen that 12 of a total of 56 male drivers had a blood-alcohol level of over 150 mg. per 100 ml. At the same time, 21 samples from this group were free from alcohol.

*Male Pedestrians.*

In this group the blood-alcohol level was over 150 mg. per 100 ml. in eight of a total of 36. Twelve samples contained no trace of alcohol.

*Other Groups.*

The numbers in the other groups are small, but it appears that a high blood-alcohol level is not infrequently found in male passengers injured in road traffic accidents. In 11 patients of the series the level was over 200 mg. per 100 ml. This group was made up as follows: five male drivers, three male pedestrians, two male passengers and one female passenger. One only, a male driver, had a level of over 300 mg. per 100 ml.; the actual figure was 314.


### Summary.

The results are recorded of the investigation of 173 blood samples taken from among 622 patients admitted to the adult wards of a large public hospital as a result of road-traffic accidents. It was our intention to take a sample from every patient in this group, and the factors which determined the selection of patients for sampling have not been defined. Sixty-two of the samples were found to contain no alcohol. Twelve of 56 male drivers and eight of 36 male pedestrians had blood-alcohol levels of over 150 mg. per 100 ml. of blood. In 11 of the total of 173, the value was over 200 mg. per 100 ml., the top figure being 314 mg. per 100 ml.



### Acknowledgement.

This pilot study, which was supported by a research grant from the University of Melbourne, was made as part of a larger inquiry into the medical and social consequences of road accidents. We gratefully acknowledge the help, both willing and unwilling, of many resident medical officers and the forbearance of very many of our colleagues.



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## "VIRONIL" IN MEASLES.

By PAUL MESTITZ, M.B., B.S., (London), B.Sc., M.R.C.P. (London), M.R.A.C.P.,
*Waroona, Western Australia.*

THE makers of N'N'anhydrobis-(beta-hydroxyethyl) biguanide hydrochloride, marketed in this country as "Vironil", claim that this "oral anti-viral agent" is effective in the treatment of measles. My experience does not give support to this claim.

All the patients treated were aged under 10 years. The drug was given as suggested by the makers, in a dose of one or one and a half tablets three times daily. A few children began treatment with "Vironil" on the day when they became unwell, and continued for at least eight days. The remainder began the treatment as soon as possible after their exposure to infection, and continued for at least 16 days.

Ten children were treated. All had been in contact with known cases of measles, and all subsequently developed measles. Eight of the 10 had a sibling who was also at risk, and who was left untreated to serve as a comparison. Assessment was left to the mother in each case. This was the only practicable method under the circumstances; moreover, it seemed that the drug would have to prove itself of unequivocal benefit to be acceptable in general practice.

Of the two children without untreated siblings, one had a severe attack, to which I was called out late at night. The second had a mild attack, and then developed pneumonia a few days later. Of the eight children with an untreated sibling, three were said to have benefited from the treatment. One had a milder attack than her sister, one had a "full-blown attack but less cough" than her brother, while a third child had a "milder" attack than an untreated brother; but in this family a third brother, given "Vironil", had the severest attack of all. Four children were said to have shown "no benefit", although in one of these the onset of the illness appeared to have been delayed by three or four days. The eighth child was said to have had a more severe attack than her untreated sister.

### Conclusions.

There was no clear evidence in this small trial that "Vironil" benefited children with measles. When a further outbreak occurred some weeks later, not a single mother asked for "the new tablets" for her child.

## INTERNAL FIXATION IN HIP ARTHRODESIS.

By A. F. DWYER, F.R.A.C.S.,
AND
C. A. CASS, M.B., B.S., F.R.C.S.,
*St. Vincent's Hospital, Sydney.*

THE use of a Küntscher nail to secure internal fixation in arthrodesis of the hip has been found practical in a variety of conditions. Although we have not operated on many patients to date, our series does include a wide range of pelvic shapes and pathological processes. We have found it possible in every case to splint the hip rigidly at an angle which we regarded as satisfactory.

Two Japanese surgeons (Onji and Kurata, 1960) have reported a similar method of fixation. The only information we possess in regard to their technique indicates that they excise the head and neck of the femur, and send a nail in a retrograde direction from the acetabulum upwards and then bring it back down the femoral shaft. We do not know what steps they take to ensure that the angle of fixation is satisfactory.

The technique to be described consists basically of the intoduction of a Küntscher nail percutaneously under radiographic control, from the posterior part of the iliac crest down to the acetabulum and then down the femoral shaft. Even at the present stage we feel that certain observations can be made about this method. (i) It appears to be applicable in nearly every case when the surgeon decides an arthrodesis is the best procedure, no matter what mechanical or pathological features are present at the joint. (ii) Fixation is absolute in all directions, provided the hip carpentry is sound. (iii) It has made it possible for us to tackle certain problems whose solution seemed extremely difficult or even hopeless by any other method. (iv) It overcomes the most serious objection to arthrodesis—namely, the prolonged immobiliza-

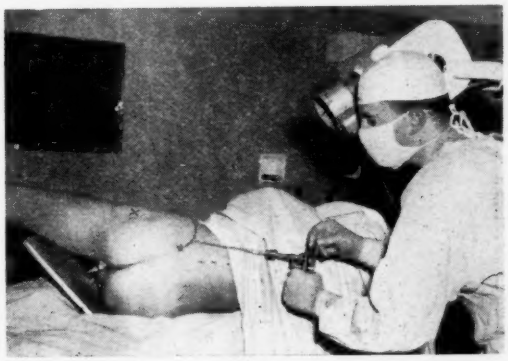

FIGURE I: This shows the positioning of the patient for the introduction of the guide and for obtaining an oblique lateral radiograph.

tion of the patient in plaster of Paris with its attendant possibilities of knee stiffness and various medical sequelæ, especially in older patients.

The ultimate usefulness of this method of fixation will be determined only by much more experience, but undoubtedly the percentage of successful fusions and the rate at which fusion occurs will vary with the pathological processes encountered as well as the hip surgery.

### Technique of Introducing the Nail.

The technique of introducing the nail is illustrated in Figures I to IX[1] but attention may well be drawn to some points. (i) The lateral position, with the good leg fully flexed, enables us to get an oblique lateral radiograph and also throws the posterior part of the iliac crest into greater prominence. (ii) A Steinmann pin of appropriate diameter is introduced percutaneously into the posterior part of the iliac crest and drilled towards the acetabulum. Because the pelvis and legs are not covered in drapes, it is not difficult to visualize the subsurface anatomy, and place the first pin fairly close to the correct position. (iii) Radiographs are then taken. The antero-posterior view must show the entire pelvis and it must be squarely taken, so that the coccyx and symphysis pubis are in line. It is on this view that we gauge the angle of abduction necessary for the nail. The oblique lateral view will show only the point of the pin, the acetabulum and the head, neck and upper part of the shaft of the femur. Unless the pin is pushed well down, it will not appear on the film. (iv) To date we have found the first pin close to line, but never perfect. A second pin, introduced at an adjacent point and corrected as to line by reference to the first pin, is then drilled home. We have not yet needed more than three attempts. (v) A Küntscher nail is introduced over the guiding pin and driven as far as the acetabulum. The guide pin is then removed.

[1] For Figures II to IV and VII to IX see art-paper supplement.

### Further Procedures.

At this stage a wide range of possible surgical attacks can be envisaged, and the best operation will vary with the mechanical and pathological conditions encountered. In two cases we were able not only to send the nail as far as the acetabulum percutaneously, but even to send it down the femoral shaft. Both these patients had deep acetabula, coxa valga and joints which were sufficiently mobile to be held in good position. These patients were then rolled on to their backs, and through a modified anterior approach, an ileo-femoral graft was slid across the already-splinted hip. In the average osteoarthritic joint, the nail is left at the acetabulum until the hip has been remodelled, through a postero-lateral incision. This would generally involve deepening the acetabulum considerably, so that the femoral shaft can move medially and be engaged by this nail. The cancellous bone so obtained can be packed about the head after fixation. If the head and neck are missing, owing to previous disease or surgery, the nail is left at the acetabulum. A postero-lateral incision is again used to remodel the great trochanter and acetabulum, so that the nail can engage the shaft. If we are dealing with a hip that is already fused in malposition, it is obviously possible to do a very high osteotomy and hold it with the nail.

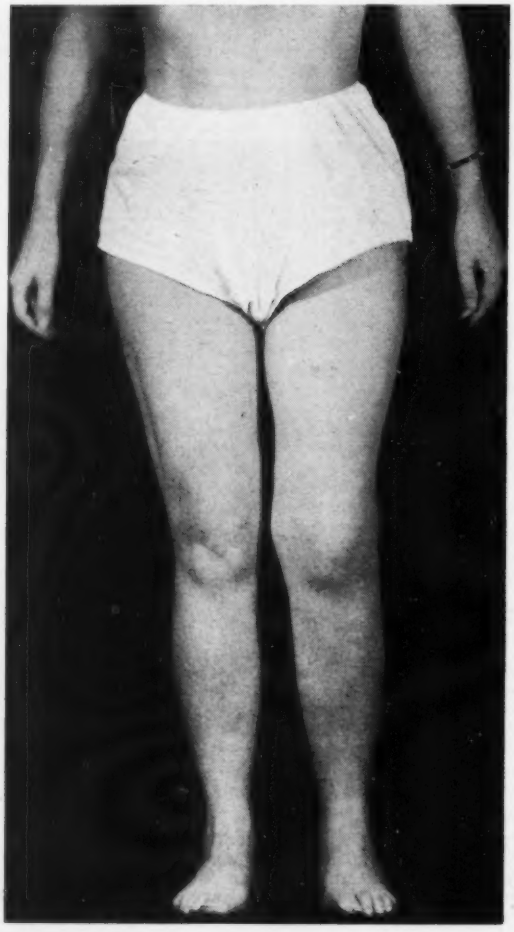

FIGURE V: Patient of Case I, showing angle of fixation of hip—anterior view.

### Reports of Cases.

CASE I.—A woman, aged 26 years, had had tuberculosis of the left hip since the age of 13 years. She had been treated by frame fixation, plaster of Paris immobilization, drainage of abscesses and antibiotics for two and a half years in Glasgow. After her migration to Australia her hip joint was still subject to flares of activity and an arthrodesis was indicated. In this case percutaneous fixation of the hip was achieved and then an ileo-femoral graft was carried out. The patient walked with crutches at two weeks, and three months after operation the graft appeared to be well incorporated.

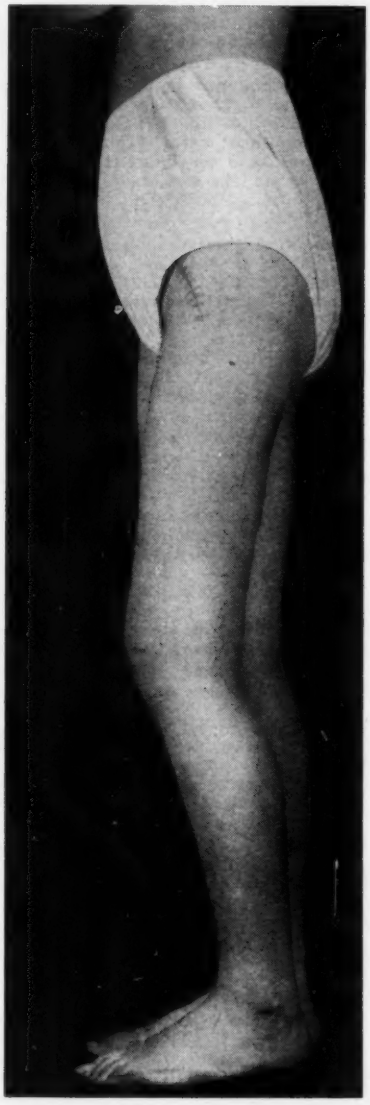

FIGURE VI: Patient of Case I, showing angle of fixation of hip—lateral view.

CASE II.—A very fit, active woman, aged 53 years, engaged in office duties, had been under observation for pain and stiffness of the left hip for six years. During this time her pain, stiffness and deformity had increased and the radiological appearance had indicated deterioration of the condition. Meanwhile her right hip had shown restriction of

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**1**

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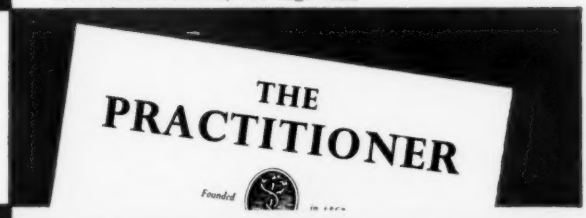
Sigmamycin (Synermycin) has been shown in this study to fulfil these requirements."

°The use of Sigmamycin (Synermycin) in Pædiatrics; Wolman, B., The Practitioner, 185:199, 1960.



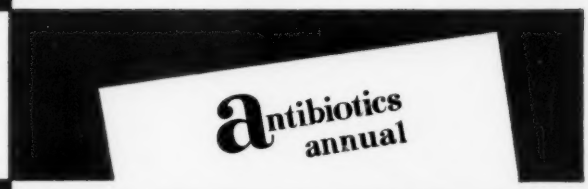

**IT CAN SUCCEED WHERE OTHER ANTIBIOTICS HAVE FAILED**

**2**

The Lecturer in Child Health, University of Glasgow, writes:—

°"That this blend of antibiotics (Synermycin) has succeeded where other antibiotics had failed is indisputable."

°Combination Tetracycline-Oleandomycin Treatment of Acute Respiratory Infection in Childhood; Arneil, G. C., Antibiotics Annual, 1958-1959.




**EMERGENCE OF RESISTANCE IS FORESTALLED**

**3**

At Royal Prince Alfred Hospital, Sydney, Thomson, et al., compared the rate of emergence of resistance of staphylococci and found that whilst resistance emerged †"in about 50% with tetracycline, it occurred in only 12% with oleandomycin-tetracycline, and then after a greater number of transfers, as compared with its constituents."

†Development of Resistance to Antibiotics by Staphylococci: A comparative study using tetracycline and oleandomycin separately and in combination; Thomson, et al., M.J.A., 12th September, 1959.

°"Studies of Sigmamycin (Synermycin) (a combination of 2 parts tetracycline and 1 part oleandomycin) have confirmed claims that the mixture delays in vitro the emergence of resistant variants of Staph. aureus."

°In-Vitro Activity of Sigmamycin (Synermycin); Fairbrother, R. W. (1957), Lancet, 2:974.

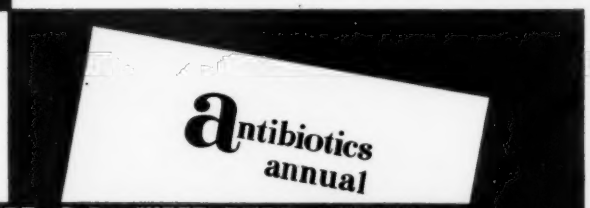
**CROSS RESISTANCE IS INSIGNIFICANT CLINICALLY**

**4**

Resistance of organisms to Synermycin has been shown to be much less than to other Broad Spectrum Antibiotics. This further reduces the already low incidence of cross resistance between oleandomycin and erythromycin.

*"Of 101 hospital isolates (Staph. aureus) resistant to erythromycin on a clinical basis, 73% proved to be sensitive in vitro to oleandomycin."

*Oleandomycin: Cross-resistance Studies with Clinical Isolates of Micrococcus pyogenes var. aureus; English, A. R., Antibiotics Annual, 1957-1958.

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movement and progressive radiological changes, but as yet no pain or deformity. It seemed that ultimately this patient would be best served by one stiff, stable hip and one mobile hip. We decided to fuse the left hip and later, when symptoms made it necessary, to carry out some form of arthroplasty on the right side. The second type of procedure was carried out on this patient. She walked with crutches at two weeks, and at three months fusion appeared radiologically to be solid.

CASE III.—An ex-miner, aged 62 years, was first seen in 1957. He had gross osteoarthritis of both hips, with severe pain and flexion deformities of almost 90°. An arthroplasty, with a Moore's prosthesis, was carried out on the left side. One year later the condition of this hip was very good and a similar procedure was performed on the right side. Unfortunately, and for no known reason (except possibly the fact that both hips had been subjected to operation), a progressive absorption of bone took place, which resulted in the settling of the prosthesis down the femoral shafts, and a sinking of the prosthetic heads more deeply into the pelvis. By 1960 the pain and disability were such that the patient could walk for short distances only, and then only with the aid of two crutches. It was decided to fuse the left hip for stability and later to consider a revision of the mobile right hip. The third type of procedure was used on this patient, and, in order to control the rotation, the upper part of the femoral shaft was so shaped that the medial cortex rested under the acetabulum and the great trochanter occupied the acetabulum with cancellous bone packed about. The patient was allowed to leave hospital at one month, because, in spite of the fact that his right hip was painful and he took all his weight on his left side, clinical fixation was absolute. When he returned at three months after operation, a little rotary movement was possible at his hip and the radiographs showed that the inferior lip of the acetabulum had crumbled and the great trochanter was now pushing up to the roof of the acetabulum. This rotary mobility has persisted for three months and probably an additional graft will be necessary to secure bony ankylosis.

### Summary.

1. A versatile method of internal fixation for hip arthrodesis is presented.

2. The method is not difficult, although radiographic control of the Steinmann's pin guide must be very good. Although tedious, this phase of the operation involves only light anæsthesia and there is no blood loss.

3. Fusion has been rapid in the first five cases, except that one patient was allowed to take full weight too early for the mechanical conditions present.

4. Finally, we may note that to a patient whose hip has not fused after several months of plaster-of-Paris immobilization, the prospect of a further operation must always seem disastrous, but is not nearly so upsetting when the patient has not been immobilized, and has left hospital in a few weeks.

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## Reports of Cases.

## PAGET'S DISEASE OF THE VULVA WITH INVASION.

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IT is understandable that confusion takes charge in the appreciation of rare diseases. Such is the case if only one or two opportunities arise in one's lifetime of observing a clinical picture of some scarcity.

In the well-known monograph by Hunt, "Diseases Affecting the Vulva", we read the following sentence: "Two forms of intra-epidermal cancer have been recorded on the vulva—Paget's Disease and Bowen's Disease." In some cases of Paget's disease this statement is not really correct, as Paget's disease may become malignant and present histological symptoms of frank invasion.

### Clinical Record.

On November 18, 1960, a woman, aged 47 years, was referred to me by a colleague (Dr. D. D. Frank). She had had one pregnancy which ended in a miscarriage at the age of 27 years. Nephrectomy for kidney abscess was performed at the age of 21 years and this operation was followed three months later by appendicectomy. At the age of 27 years this patient had bilateral salpingectomy. She was menstruating regularly up to 12 months ago and the menopause did not cause her any inconvenience.

The patient had had itching of the vulva and surrounding area for approximately three years. Although she had sought medical advice, her irritation had not abated. For the past 18 months the vulva had been too sore to allow sexual intercourse. The irritation had been too intense to permit her to sleep without hypnotics.

On examination, the right lesser lip, in its entirety, was found to be swollen, and the skin over it thick and indurated. The whole of the vulva was red and covered with scratch marks. The right lesser lip was moist, and in several places was covered with encrusted discharge. The area of the skin, particularly in the groove between the greater and the lesser lip, showed white patches in a sequence from the clitoris halfway down the introitus vulvæ. The most striking feature in the above changes seemed to be that they were all localized to the right half of the vulva, the left side being without any unusual changes. It was considered that the above asymmetry was sufficient reason for admitting the patient to hospital for biopsy. Nowhere could one find on the indurated left lip a broken epithelial surface or ulceration.

The above-described coarse, dry-looking, slightly scaling and dusky-red right lesser lip was removed as a whole for histological examination. One could not single out a solitary patch, hence we thought that the whole eczematous surface should be taken for examination. The histological characteristics were those of Paget's disease, showing invasion of the corium.

Histological description was as follows: "Microscopically, the vulvar skin is hyperplastic and shows hyperkeratosis and elongation of the rete pegs [Figure I].[1] The outstanding feature is the large number of malignant cells in the epidermis. They are large cells with pale cytoplasm and tend to be arranged in large clusters immediately above the basal layer [Figure II]. Mitoses are numerous. In several areas the malignant cells are invading the dermis [Figure III]. The histological features are those of Paget's Disease of the vulva with invasive carcinoma [Figure IV]."

On the grounds of the histological findings, the patient was admitted to hospital a second time and bilateral inguinal and femoral lymphadenectomy and vulvectomy were performed by Dr. M. J. L. Stening. Further pathological examination showed no malignant tissue in the vulva or in the glands. Apparently the whole extent of the growth must have been removed at the time of the biopsy.

### Discussion.

Up to 1950, 12 cases of extramammary Paget's disease have been reported. Huber and Gardener suggested that these lesions originated from apocrine glands. In a total of 50 cases of carcinoma of the vulva three cases of Paget's disease were found. They also maintained that the neoplastic changes in the apocrine glands presented as adenocarcinomas. Paget's disease of the vulva is identical with Paget's disease of the nipple. Recently Federici reported one case of Paget's disease in the vulva and found no carcinoma in the underlying apocrine glands, although he sectioned some 10 blocks. He puts forward the theory that Paget's disease of the vulva is located neatly in the embryonic milk-line. He maintains that there is no proof that the lesions start in the apocrine glands, spreading

[1] For Figures I to IV see art-paper supplement.

from there into the epidermis. It seems to him that the gland involvement in the subepithelial layers is secondary to the skin lesions. An excellent review of Paget's disease is to be found in the work of Woodruff He surveyed 19 cases from the literature, to which he added two cases of his own. Of the cases surveyed by Woodruff, in two only were invasive underlying carcinomas present. In view of the cases tabulated by Woodruff, Paget's disease of the vulva must be regarded in the majority of cases as a non-invasive, slow-growing, intraepithelial process. One may say that these are the precursors of frank invasive cancer. In the series there were only five patients under the age of 50 years. As most patients with carcinoma of the vulva are in the older age group, it is rather tempting to speculate how the prolongation of life expectancy will make carcinoma of the vulva a more common disease than it is today. Pruritus was the predominant or the only presenting symptom in practically all cases. The most common site for Paget's disease was on the greater lips. The usual appearance was that of a moist, red, uncircumscribed lesion with crust formation. Occasionally leucoplakia was present, just the same as extensive leucoplakia was noted on the right half of the vulva in our own case. In the series mentioned the duration of symptoms was anything from one to 17 years, and out of 22 cases, in four carcinoma was present in various pelvic organs.

It is controversial whether the intraepithelial carcinoma in these cases is a result of metastatic spread from underlying glandular elements. However, this view is supported by Muir, Weiner and Huber. Artzt and Kern recognize two varieties of Paget's disease: (i) a variety which is to be regarded as a precancerous state; (ii) Paget's disease with definite underlying carcinoma.

The origin of the so-called Paget's cells has given rise to several theories. However, it is safe to assume that wherever apocrine glands are present — that is, in the perianal region, the armpit, the breasts and the vulva — Paget's disease can be observed. These apocrine glands may be regarded as auxiliary sex glands. Their function increases during such times as pregnancy, puberty and the premenstrual period—that is, whenever increased hormonal demand is placed on inner secretory glands (Way and Mannheimer). Paget's disease is usually found in the localities where apocrine glands abound. Paget's cells have been morphologically likened to the outer layers of hair follicles, and also to cells in sebaceous glands. Montgomery states that these clear cells resemble melanoblasts, whether or not they contain pigment; a certain amount of resemblance between these clear cells in junction nævi and Paget's cells is possible.

Woodruff maintains that Paget's cells may originate from two sources—either from the pigment-producing clear cells, or from the epithelium of the apocrine glands. Basically all these cells originate from the ducts of apocrine glands.

Although in most cases Paget's disease of the vulva runs a course similar to such dermatoses as Bowen's disease, this is not true in all instances. The patient observed by us had an invasive type of carcinoma which called for an extensive, radical type of surgery. It is possible that extensive and early biopsy will reveal invasive tendencies in some of the conditions around the vulva which are now regarded in a more optimistic light.

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## FARMER'S LUNG: A CASE REPORT.


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AND

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SINCE 1932, with increasing frequency a respiratory illness has been reported among farmers who have been exposed to mouldy forage. This disease is a distinct clinical syndrome, with uniform clinical, physiological, pathological and röntgenographic changes. For want of a better title, this syndrome has been called farmer's lung.

Campbell (1932) first described a peculiar respiratory illness in five farmers seen in the months of April and May. The illnesses were all associated with contact with white mould on hay and grain which was being handled by these farmers.

Fawcett (1936) published articles describing similar respiratory illnesses. He concluded that the disease was an actual mycotic infection in the bronchi.

Duncan (1945) suggested a comparison with byssinosis.

Zettegren (1950) performed experiments using rabbits. These animals were divided into three groups—A, B1 and B2. The rabbits of Group A were exposed to sterile threshing dusts, and those of groups B1 and B2 were exposed to sterile threshing dusts mixed with viable *Candida albicans*. Groups A and B1 were sacrificed five days after exposure was completed. Group B2 was sacrificed 10 weeks after exposure was completed.

Rabbits in each of the groups developed granulomatous changes in the lungs of slightly different histology, but the fungi did not multiply in the lung. Studdert (1953) described four patients with this disease and suggested that the lung changes may be due to irritation by a foreign protein.

Fuller (1953) described a review of 32 cases in which he suggested that there may be three distinct phases of the disease: (i) an isolated acute attack; (ii) the subacute or chronic attack with a spontaneous tendency to recover; (iii) the chronic irreversible stage with permanent lung change, for example, emphysema and fibrosis occurring after repeated exposure over some years.

Tornill (1946), Soucheray (1954) and Williams and Mulhall (1956) all have reported cases of the disease.

Dickie and Rankin (1958) described a series of 36 cases. They believed that this disease was not related, but was superficially similar to the frequently encountered silo-filler's disease. All but two of their patients reported had a positive history of exposure to mouldy forage.

Mouldy hay, grain, fodders, silage, tobacco or threshing dusts have all been reported to cause a typical illness. It would seem that farmer's lung may be caused by a sensitization of the individual to the moulds or the products of these moulds, although this is not entirely proven.

The exact relationship between the moulds and the susceptibility of the individual so far remains unclarified. It is obvious that the latter plays a major part, as the disease is not manifested in all people who have been in contact with the mould spores.

The age incidence is variable, ranging in previous case reports from 18 years to 55 years.

The sex incidence is predominantly in favour of males.

It is important to note that the mould reaches its highest concentration during the milling of the vegetable substances, and thus it is during that period that the maximum danger is present.

## Clinical Features.

A farm hand, aged 46 years, from the south coast of New South Wales, was admitted to the Royal Prince Alfred Hospital on August 3, 1960. During the 12 months prior to his admission, the patient had on several occasions been milling hay. This hay had on occasions been mouldy, and an extremely dusty atmosphere had been present during the process.

Early in July, 1960, the patient noticed that he was becoming breathless on exertion. He suffered severe night sweats and became mildly anorexic. The breathlessness progressed in severity until such time as the patient was unable to perform the smallest task without extreme discomfort.

An X-ray film of the chest (Figure I)[1] taken some two weeks after the onset of symptoms showed such marked abnormalities that prompt investigation was undertaken.

On admission to hospital the patient was breathless on the mildest exertion and mildly anorexic, but had no elevation of his temperature. The lips and ears were faintly cyanosed. No finger or toe clubbing was detected. The respiratory rate was 25 per minute, and breathing was carried out with the aid of the extraordinary muscles of respiration. The pulse rate was 80 per minute. The blood pressure was 140/90 mm. of mercury. Auscultation of the chest revealed coarse inspiratory rales audible at both lung bases.

An X-ray film of the chest taken on August 3 (Figure II) showed marked progression of the changes previously noted (Figure I). The hæmoglobin value was 16·5 grammes per 100 ml. A white-cell count revealed 17,000 cells per cubic millimetre, of which 76% were neutrophils, 14% were lymphocytes, 4% were monocytes, 2% were eosinophils and 3% were basophils. The blood sedimentation rate was 19 mm. in one hour (Westergren). The thymol flocculation test gave a strongly positive result, and the zinc sulphate turbidity test gave a result of 10 units (the normal being 3 to 8 units). The serum protein level was 6 to 9 grammes per 100 ml. The Mantoux reaction was negative (1:100) and no fungi were seen on a Gram-stained smear of the sputum or cultured from it.

The vital capacity was 3·2 litres (75% of the predicted value) and the maximum breathing capacity was 115 litres (92% of the predicted value). Examination of urine revealed no abnormal features, and a scalene node biopsy revealed normal lymphoid tissue.

A right thoracotomy was performed on August 11, 1960, and material for a lung biopsy obtained. At operation the entire right lung appeared to be infiltrated with discrete white nodules which resembled neoplastic tissue. Histological examination (Figure III) revealed follicular groups of histiocytes surrounded by an infiltrate of inflammatory cells and proliferating fibrous tissue.

After the thoracotomy, the patient had a 10-day convalescence; he was then given 20 mg. of prednisone each eight hours, commencing on August 19, 1960. This dosage was gradually reduced until September 9, 1960, when the patient was discharged from hospital, taking 5 mg. of prednisone every eight hours. The X-ray film of the lung fields at the commencement of therapy may be seen in Figure IV. Symptomatically he felt no better than on his admission to hospital. Within four days of commencing prednisone therapy, the patient felt much better and was able to walk up stairs without undue distress.

After one week's prednisone therapy, the dose having been reduced to 10 mg. every eight hours, the radiological appearance of the lungs showed very considerable improvement (Figure V).

[1] For Figures I to V see art-paper supplement.

## Discussion.

Farmer's lung is the result of an allergic reaction to the spores from mouldy forage manifested by typical clinical, physiological, pathological and radiographic changes, together with a failure to culture a fungus from the sputum. Although there are some difficulties in making a definite diagnosis of farmer's lung, this case is considered to have furnished sufficient positive evidence to support such a diagnosis: (i) a definite history of repeated exposure to mouldy forage; (ii) classical symptomatology—that is, dyspnœa, variable cyanosis and cough (usually unproductive); (iii) X-ray changes typically suggesting infiltrative or granulomatous lesions; (iv) the histological appearance of the typical granulomatous reaction; (v) sputum culture which grew no fungi.

Sarcoidosis may manifest similar symptomatology, and there is a resemblance between the lesions of sarcoidosis and those of farmer's lung. However, there is less inflammatory infiltrate and less active fibrosis in sarcoidosis. Furthermore, there was no confirmatory evidence amongst the other tests for the diagnosis of sarcoidosis. Tuberculosis could be excluded by (i) the negative Mantoux reaction, (ii) the negative results of sputum tests, (iii) minimal symptomatology, (iv) the quick response to steroid therapy, and (v) the histological picture.

Wegener's granulomatosis is usually associated with sinus infection, hæmoptysis, prostrating symptoms, lung cavity formation, different histology and anæmia.

Other granulomatous conditions, such as anthracosis, silicosis and beryllosis may be excluded by the absence of a history of exposure to agents causing these diseases.

## Summary.

A case is described of a farm labourer who after exposure to the dust of mouldy hay developed a granulomatous reaction in his lung parenchyma with associated severe respiratory insufficiency. This condition showed histological changes typical of those seen in a condition known as farmer's lung.

Complete remission, judged both clinically and radiologically, followed the institution of corticosteroid therapy.

Brief reference has been made to the relevant literature.

## Acknowledgements.

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# HYPERPLASIA OF THE PARATHYROID OXYPHIL CELLS.

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ALTHOUGH it is eighty years since Sandstrom (1880) first observed certain cells in the human parathyroid glands, and over sixty since Welsh (1898) clearly described and named them "oxyphil" cells, no function has as yet been ascribed to them. Marine (1928) reviewed the literature relating to these cells in his chapter on the parathyroid glands in Cowdry's "Special Cytology"; he did not consider that they represented a separate endocrine system. Hadfield (1936) regarded them as a resting phase of the secretory cycle of the other parathyroid cells, and Eger and Van Lessen (1954) considered them to be products of involution and the wear-and-tear process. However, more recently it has been shown that the fine granules within these cells give a positive histochemical staining reaction for phospholipid (Christie, 1955). This is a property which they share in common with the pituitary acidophil cells; in fact, the close resemblance between these two cell types was noted by Welsh (1898) and more recently by Maximow and Bloom (1948).

Solitary adenomas of the oxyphil cells have been reported, but so far as I am aware, hyperplasia of these cells involving two or more glands has not been recorded. It is the purpose of this communication to report 13 such cases in which pronounced oxyphil cell hyperplasia was present, collected from a random series of over 300 autopsies. The available clinical and post-mortem findings, as well as histological reports on the parathyroid glands, are described in some detail in two cases and are summarized in the remaining 11 cases (Table I).

In all cases the multiple hyperplastic foci of oxyphil cells involving more than one gland consisted of variable numbers of pale and dark cells, and were devoid of enmeshed fat even though fat cells were frequently numerous in the adjacent parenchyma. These foci were also highly vascular, with open capillaries filled with erythrocytes.

There was no increase of the fibro-cellular stroma in any gland. In some cases variable numbers of the principal cells were vacuolated and corresponded to the vacuolated principal cells of Eger and Van Lessen (1954), rather than to true *Wasserhelle* cells.

Only in Case II was gross parathyroid gland enlargement present. In Cases I, VI and VII it was mild only.

### Case I.

Mrs. A., a moderately obese woman, aged 65 years, had been in her usual health until the morning of admission to hospital, when she felt "queer". She suddenly lapsed into a state of unconsciousness whilst drinking morning tea. Her blood pressure was 300/130 mm. of mercury on her admission, and she was still unconscious. (Relatives stated that she had suffered from "high blood pressure" for some time.) The lumbar puncture showed blood-stained fluid under pressure. At autopsy, cerebral hæmorrhage was confirmed. The heart weighed 420 grammes, and both ventricles were hypertrophied. The kidneys weighed 125 and 120 grammes respectively, and showed nephrosclerotic changes — namely, arteriolar thickening with a few hyaline glomeruli and fibrous-tissue scars. The gall-bladder and bile ducts were reported as normal.

*Histological Findings.*

Four glands, in all weighing 1·10 grammes, were examined. One was enlarged, measuring 1·5 by 0·8 cm.; the second was slightly enlarged (1·0 by 0·5 cm.), and the remaining two were of normal size, measuring 0·8 by 0·4 cm. and 0·5 by 0·5 cm. respectively. In all four glands the most noticeable feature was pronounced hyperplasia of oxyphil cells, which formed large nodules of both pale and dark cells. The largest gland contained an ovoid nodule 0·8 cm. long in its maximum dimension. In the next largest gland there was a spherical collection 0·4 cm. in diameter. The oxyphil cell masses were almost completely devoid of enmeshed fat cells, in contrast with the considerable amount dispersed through the remaining parenchyma composed of principal cells (Figure I). However, in the second largest gland there was one area, measuring 0·2 cm. in diameter, in which there was no fat and the principal cells were tightly packed together, indicating a hyperplastic zone of principal cells. All four glands were highly vascular throughout, but particularly so in the clumps of oxyphil cells. Water-clear cells were absent, and there was no increase in fibrous stroma.

### Case II.

The history of this case is recorded in much greater detail, for reasons given later.

Miss B., aged 30 years, whose death followed 14 admissions to hospital over a period of 12 years, was first examined in December, 1946, when she complained of backache, headache, tiredness, pains in the legs, palpitation and dysuria. She was said to have had Bright's disease in 1943, and had been bedridden for five weeks in 1945 with pains in the arms and legs. When she was in hospital in 1946, her blood pressure was 110/70 mm. of mercury, and tenderness was present in both renal angles. She was afebrile, and her urine was found to contain a trace of albumin on several occasions. The results of special investigations were as follows. The hæmoglobin value was 7·3 grammes per 100 ml.; the blood urea content was 101 mg. per 100 ml.; the serum calcium content was 11·3 gm. per 100 ml.; the carbon-dioxide combining power was 28 volumes per 100 ml.; the serum uric acid content was 3·6 mg. per 100 ml.; the serum inorganic phosphate level was 4·5 mg. per 100 ml. Although a trace of albumin was then noted in her urine, there were no microscopic abnormalities, and it was sterile on culture.

In 1955 her vision deteriorated. Two years later (1957) she complained of dyspnœa, generalized bone pains, polydipsia and polyuria. At this time the blood urea level was 252 mg. per 100 ml.; the serum uric acid level was 8·2 mg. per 100 ml.; the serum inorganic phosphate level was 11·1 mg. per 100 ml.; and the serum cholesterol level was 225 mg. per 100 ml.

Three days before her death in May, 1958, the blood urea level had risen to 550 mg. per 100 ml., and the serum calcium and inorganic phosphate levels were each 12 mg. per 100 ml.

*Autopsy.*

The heart weighed 400 grammes. The left ventricle was hypertrophied. The spleen was enlarged, weighing 275 grammes, but was otherwise normal. The liver weighed 1675 grammes. The gall-bladder and bile ducts appeared normal. Both kidneys were small, the right and left organs weighing 50 and 60 grammes respectively. Their surfaces were very granular, and very little parenchyma remained.

The parathyroid glands were all enlarged. The left superior gland measured 2·1 cm. in its longest axis and weighed 1·2 grammes; the left inferior gland measured 2·8 cm. in its longest axis and weighed 2·8 grammes. The right superior and inferior glands measured 2·0 cm. and 1·2 cm. respectively in their longest axes. Apart from bilateral pes cavus, no other abnormalities were noted.

*Histological Findings.*—There was extensive calcinosis of the alveolar septa throughout the lungs. A random section of bone showed the presence of osteitis fibrosa, though not of extensive degree. In the kidneys there was extensive atrophy, with hypertrophy of the few remaining nephrons. An occasional glomerulus had the appearance of glomerulitis. There was also extensive calcinosis of the tubules. In all four parathyroid glands there was pronounced hyperplasia of the parenchyma, with large

TABLE I.

*Summary of Histological, Post-Mortem and Clinical Data in 11 of the Cases in which Oxyphil-Cell Hyperplasia was Found.*

| Case Number. | Sex. | Age. (Years.) | Number of Glands. | Measurements and Weights. (Cm.) | General Hyperplasia. | Predominant Cells. | Water-Clear Cells. | Oxyphil Cells. (Maximum Diameter of Nodules). (Mm.) | Clinical and Post-Mortem Data. |
|---|---|---|---|---|---|---|---|---|---|
| III | F. | 50 .. | 4 | 0·5×0·4<br>0·8×0·4<br>0·8×0·4<br>0·7×0·3 | Absent. | Principal. | Absent. | 0·75 | Obese. Cerebral hæmorrhage. B.P. 200/130 mm. of mercury. Heart weight: 310 grammes. Mild renal arteriosclerosis. |
| IV | M. | 78 | 4 | 0·9×0·5<br>0·7×0·5<br>0·2×0·2<br>0·5×0·2 | Absent. | Principal. | Absent. | 1·25×0·75 | Urinary retention. Cardiac failure (heart: 580 grammes). Moderate atheroma of coronary arteries. Fibrosed and shrunken gall-bladder. Blood urea level: 216 mg. per 100 ml. |
| V | F. | 58 | 4 | 1·1×0·2<br>0·9×0·3<br>0·5×0·4<br>0·5×0·4 | Absent. | Principal (many vacuolated). | Occasional. | 2·0×0·5 | Acute hepatitis of unknown ætiology, empyema of gall-bladder with calculus. Moderate atheroma of coronary arteries. Heart weight: 410 grammes. Early renal nephrosclerosis. |
| VI | F. | 73 | 4 | 0·5×0·5<br>1·1×0·6<br>1·0×0·3<br>0·5×0·2<br>(Weight: 0·39 gramme) | Very slight. | Principal (many vacuolated). | Absent. | 1·0×0·5 | Very obese. Hypertensive cardio-vascular disease (B.P. 210/120 mm. of mercury three years earlier). Blood urea level: 328 mg. per 100 ml. Heart weight: 475 grammes. Cholelithiasis and renal nephrosclerosis. |
| VII | F. | 79 | 4 | 0·9×0·2<br>1·2×0·5<br>1·0×0·2<br>0·9×0·5<br>(Weight: 0·620 gramme) | Mild. | Principal (many vacuolated). | Numerous. | 0·7 | Emaciated. Cerebral softening. Myocardial fibrosis. Gangrene of left foot. Mild nephrosclerosis and pyelonephritis. B.P.: 160/90 mm. of mercury. |
| VIII | F. | 50 | 4 | 0·8×0·2<br>0·2×0·2<br>0·3×0·2<br>0·3×0·2 | Absent. | Principal. | Occasional. | 1·0×0·8 | Cerebral hæmorrhage. B.P. 260/150 mm. of mercury. Heart weight: 305 grammes. Atherosclerotic changes in renal vessels. |
| IX | M. | 78 | 3 | 0·7×0·4<br>0·6×0·4<br>0·8×0·3 | Absent. | Principal. | Absent. | 1·5 | "Movements of a choreic nature." B.P. 150/90 mm. of mercury. Myocardial degeneration. Senile contracted kidneys. "Small" brain. |
| X | M. | 77 | 4 | 0·5×0·3<br>0·4×0·2<br>0·5×0·2<br>0·3×0·2<br>(Weight: 0·22 gramme) | Absent. | Principal. | Occasional. | 1·2×1·1 | Cholelithiasis. B.P. 210/100 mm. of mercury. Left ventricular hypertrophy and marked coronary atheroma. |
| XI | M. | 75 | 4 | 0·3×0·2<br>0·7×0·2<br>0·6×0·5<br>0·7×0·4<br>(Weight: 18 grammes) | Absent. | Principal (some vacuolated cells). | Moderate numbers | 1·2 | Retention of urine. B.P. 150/100 mm. of mercury. Chronic lymphatic leukæmia. Heart weight: 410 grammes. Severe coronary and cerebral atheroma. Moderate nephrosclerosis. Cholesterosis of gall-bladder. Focal accumulations of lymphoid cells in the parathyroid glands. |
| XII | M. | 74 | 3 | 0·8×0·5<br>0·7×0·4<br>0·9×0·5 | Absent. | Principal. | Absent. | 2·5×1·2 | Obese. Hypertensive heart disease. Heart weight: 625 grammes. Marked coronary atheroma. Ruptured atheromatous aneurysm of left internal iliac vessel. Old and recent myocardial infarction and mild nephrosclerosis. |
| XIII | F. | 76 | 3 | 0·7×0·3<br>0·5×0·2<br>0·7×0·4 | Absent. | Principal (a few vacuolated cells present). | Occasional. | 0·9 | Obese. Congestive cardiac failure. Blood urea level: 30 mg. per 100 ml. Heart weight: 400 grammes. Diffuse enlargement of thyroid gland. Cholelithiasis. |

lobules, some composed of principal cells and others of oxyphil cells, compressing the surrounding parenchyma. These lobules were devoid of enmeshed fat. For the most part their capillaries were closed. The largest masses of principal cells and oxyphil cells measured 2·0 by 1·0 cm. and 1·4 cm. in diameter, respectively. Although they were smaller, there were more oxyphil cell collections than principal cells. Taken all in all, the histological appearances suggested there were more of the former than of the latter, although both were present in great excess. In the left superior gland there was a spherical lobule 5 mm. in diameter, composed almost entirely of large water-clear cells (*Wasserhelle* cells), except for a few pale oxyphil cells. In this adenomatous collection there was an occasional open capillary containing a few erythrocytes. In their respective hyperplastic groups, the water-clear and principal cells were packed together in solid masses. However, the oxyphil cells, in addition to being arranged in sheets and cords with a loose connective tissue stroma, were also arranged in columnar fashion about irregular spaces measuring up to 1·5 mm. in diameter and filled with albuminous eosinophilic contents interspersed with erythrocytes in some spaces. The oxyphil cells showed no evidence of degenerative change. Whilst the majority were of the pale variety, there were also considerable numbers of heavily-granulated dark cells interspersed amidst them. Surrounding the hyperplastic cell masses, the original parenchyma contained a predominance of vacuolated principal cells with some collections of oxyphil cells. It retained a moderate amount of enmeshed fat and contained only a few open capillaries filled with blood.

## Discussion.

As scant attention has been paid to the oxyphil cells in the past, little information exists in the literature as to their behaviour in various diseases. In fact, even in the infrequent references to the parathyroid glands in autopsy reports, the oxyphil cells are, more often than not, just mentioned as being present or absent.

As was previously reported (Christie, 1955), clumps of oxyphil cells are frequently highly vascular, with dilated capillaries filled with erythrocytes. This was so in the cases described here. As Maximow and Bloom (1948) have pointed out in the case of the islets of Langerhans, it was the latter's great vascularity which early suggested the possibility of their being endocrine organs. This is a finding which is difficult to reconcile with the contention that such groups of oxyphil cells are principal cells in a resting condition; for if this was the case, the blood supply to these groups would be minimal and the capillaries would be closed down and empty.

Oxyphil cells contain both a Golgi element and mitochondria. Whilst I have seen multiple vacuoles of variable

TABLE II.
*Age and Sex Grouping of Series.*

| Age. (Years.) | Grading. Male. + | ++ | +++ | ++++ | +++++ | Total. | Female. + | ++ | +++ | ++++ | +++++ | Total. | Total Both Sexes. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0–20 .. | 6 | | | | | 6 | 4 | | | | | 4 | 10 |
| 21–30 .. | 2 | 4 | | | | 6 | 1 | 2 | | | | 3 | 9 |
| 31–40 .. | 4 | 6 | 0 | | | 10 | | 5 | 3 | | | 8 | 18 |
| 41–50 .. | 2 | 9 | 7 | 2 | 0 | 20 | 4 | 10 | 8 | 1 | 2 | 25 | 45 |
| 51–60 .. | 3 | 21 | 9 | 5 | 1 | 39 | 1 | 6 | 6 | 3 | 3 | 19 | 58 |
| 61–70 .. | 4 | 20 | 25 | 15 | 3 | 67 | 2 | 9 | 7 | 6 | 5 | 29 | 96 |
| Over 71 .. | 3 | 14 | 15 | 7 | 11 | 50 | 1 | 6 | 4 | 4 | 4 | 19 | 69 |
| Percentage of total for each sex | 12·1 | 37·4 | 28·3 | 14·6 | 7·6 | .. | 12·1 | 35·5 | 26 | 13·1 | 13·1 | .. | 305 |

size suggesting degenerative changes in some oxyphil cells, this is not a common finding and was not present in the present cases. Apart from a solitary group of necrotic cells in one case (Case III), there was no other histological evidence of involutional changes.

In hyperplastic nodules of oxyphil cells there are all gradations of granularity, suggesting that they form a self-contained secretory unit with cells in various stages of functional activity (Christie, 1955). However, no function has as yet been ascribed to these cells.

It is important to distinguish neoplasia from hyperplasia. Whilst this may not always be possible, the distinction adopted by Castleman and Mallory (1935) in the case of the principal and *Wasserhelle* cells seems reasonable. In describing the parathyroid glands in 25 cases of hyperparathyroidism, they proposed a classification that divided the lesions sharply into two groups, one in which the changes were restricted to one gland, to part of a gland or occasionally to two glands (presumably neoplasia), and a second group in which diffuse hypertrophy and essentially uniform histological changes in the glands occurred — a condition they classified as hyperplasia. They described two types of hyperplasia, one primary hyperplasia, in which all the cells are usually large with clear cytoplasm and nuclei uniformly orientated to the base of the cells (true *Wasserhelle* cells), and the other secondary — secondary to chronic renal disease — in which all the glands are composed, except for a "scattering of oxyphil cells", of closely-packed, normal-sized principal cells.

In 1937 these workers (Castleman and Mallory, 1937*a*) reported 12 further cases of hyperparathyroidism, and added that no case had been seen that failed to fit readily into their previously described categories. They described a further case of "primary hyperplasia" involving at least three glands (as found at operation). All three glands (two were removed completely and part of a third was removed) showed only one type of cell throughout — the *Wasserhelle* cell. There were no oxyphil or principal cells.

Solitary adenomas of the oxyphil cells occur but rarely, there being only six reports of undoubted cases (Hadfield and Rogers, 1932; Keynes, 1936; McQuillan, 1938; Norris, 1946; Willis, 1948; Underdahl *et alii* (1953).

In this paper, 13 cases of oxyphil cell hyperplasia involving three or more glands are described. Whilst isolated case reports do mention the presence of large numbers of oxyphil cells in the parathyroid glands (see Table III), no yardstick has been defined by which to decide what constitutes a significant deviation from that usually seen — that is, from normal. This difficulty was expressed by Price and Davie (1936-1937) when discussing the histology of the parathyroid glands in a boy, aged 14 years. Others have ignored both this difficulty and the significance of these cells.

In assessing the approximate number of oxyphil cells in the glands, the following classification was adopted: (i) an occasional single cell, but no clumps, in two or more glands, "+"; (ii) occasional single cells, and only a very occasional small clump in three or more glands, "++"; (iii) up to eight small clumps per gland, "+++"; (iv) greater than eight and up to 16 clumps and occasional large clumps, "++++";[1] (v) many clumps, including large clumps, "+++++". It is realized that the foregoing grading is somewhat arbitrary and, for various reasons, open to error. One particularly important error could arise from the possibility of irregular distribution of both single cells and clumps of oxyphil cells, for in making the assessment a section averaging 7μ in thickness was examined. However, when serial or near-serial sections were made of any one gland, there was never an occasion on which it was necessary to amend the grading.

Table II indicates the distribution of the various grades in each decade in my series of 305 autopsies. A few cases, in which one gland showed a solitary large clump of oxyphil cells often 1·0 mm. or more in diameter without a concomitant increase in smaller groups or single cells either in the remaining parenchyma of that gland or in the other glands, were excluded, on the grounds that this did not constitute a true hyperplasia, but rather pointed to the possibility of adenoma formation. In the case of solitary adenoma formation, four glands would need to be located and multiple sections made to avoid missing one.

It has been reported that oxyphil cells increase with age (Blumstein, 1913; Koopmann, 1921; Anderson, 1953). Indeed, Koopmann considered that they increased in a striking and constant manner up to the eighth decade.

Table II confirms that, generally speaking, these cells do increase with age, but this is not invariably so.

Also, under the age of approximately 40 years, the oxyphil cells are normally present singly with or without an occasional small group. When present, the latter is usually situated at the periphery of a gland. During and after the fifth decade, oxyphil cells tend to increase in number to a lesser or greater extent. However, this increase is not invariable, being absent in 20 of 268 subjects (7·5%) aged over 41 years in the foregoing series.

The bottom horizontal column in Table II shows a remarkable similarity in the percentages of cases in grades (i) to (iv) for each sex. However, in the cases grouped in grade (v) the percentage for females is twice that for the males, even in spite of the fact that the average age of the males is, on the whole, slightly higher than that of the females.

Of the 29 subjects (15 male, 14 female) in 305 autopsies grouped as grade (v), 13 (4%) showed very marked hyperplasia compared with one subject (Case II) showing a marked increase in size of the glands, and three subjects showing a mild increase (Cases I, VI and VII).

[1] A large clump was defined as having more than 100 oxyphil cells with nuclei; this excluded cells which had been "sliced" in cutting the histological sections 7μ thick.

ILLUSTRATIONS TO THE ARTICLE BY I. A. COOPER AND T. M. GREENAWAY.

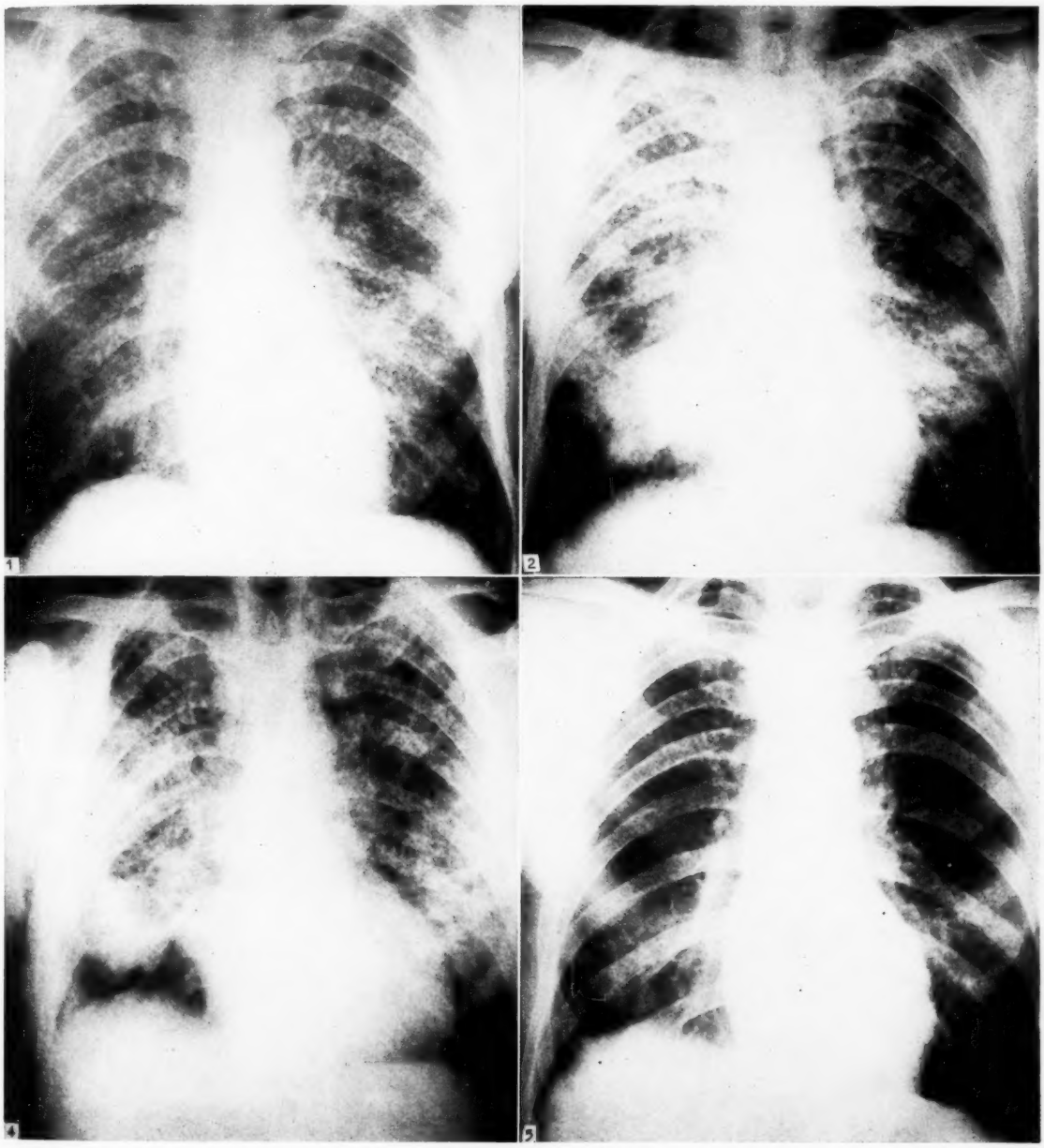

FIGURE I: An X-ray film of the chest (postero-anterior view) showing a diffuse granular infiltration involving both lung fields. This film was taken two weeks prior to the patient's admission to hospital. FIGURE II: An X-ray film of the chest (postero-anterior view) taken on the patient's admission to hospital, showing increase in the size of the granulomata. Some areas show confluent opacities. FIGURE IV: A post-thoracotomy X-ray film of the chest (postero-anterior view) showing gross granulomatous infiltrate in both lung fields, with some confluent areas. There is also some surgical emphysema present on the right side. FIGURE V: An X-ray film of the chest (postero-anterior view) showing almost complete clearing of the lung fields with only fine mottling in both mid-zones remaining.

ILLUSTRATION TO THE ARTICLE BY I. A. COOPER AND T. M. GREENAWAY.

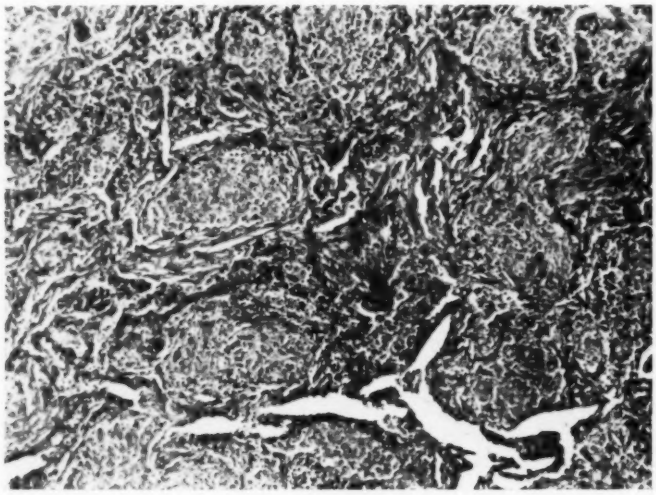

FIGURE III: Photomicrograph showing follicular groups of histiocytes surrounded by an infiltrate of inflammatory cells and proliferating fibrous tissue. (Hæmatoxylin and eosin stain × 75.)

ILLUSTRATION TO THE ARTICLE BY A. C. CHRISTIE.

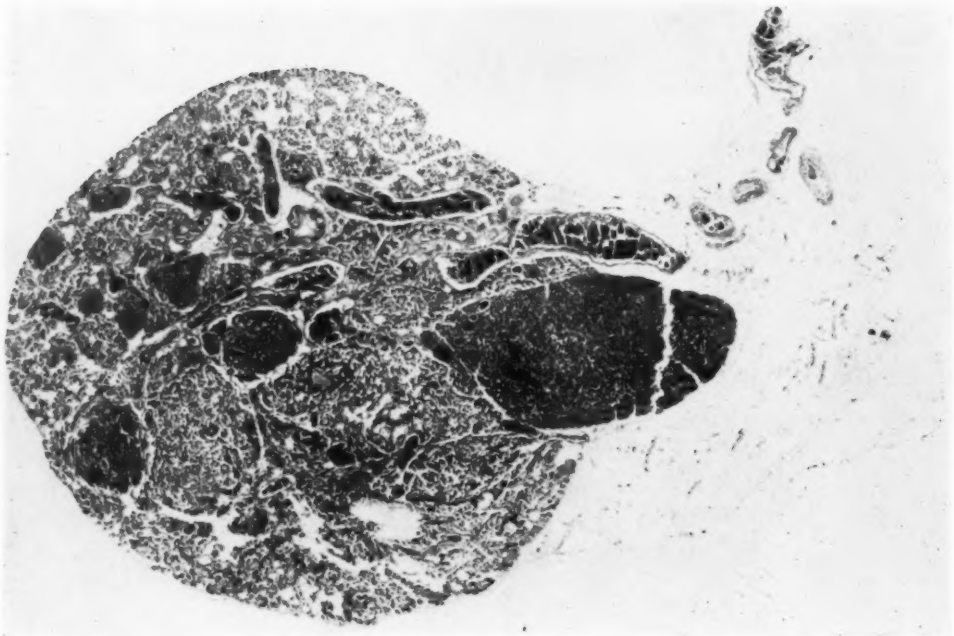

FIGURE I: Case I: Showing one large collection and several smaller collections of oxyphil cells dispersed throughout the gland. Note the absence of enmeshed fat in these hyperplastic foci, in contrast with the remaining parenchyma. (Hæmatoxylin and eosin stain, × 15.)

## ILLUSTRATIONS TO THE ARTICLE BY A. F. DWYER AND C. A. CASS.

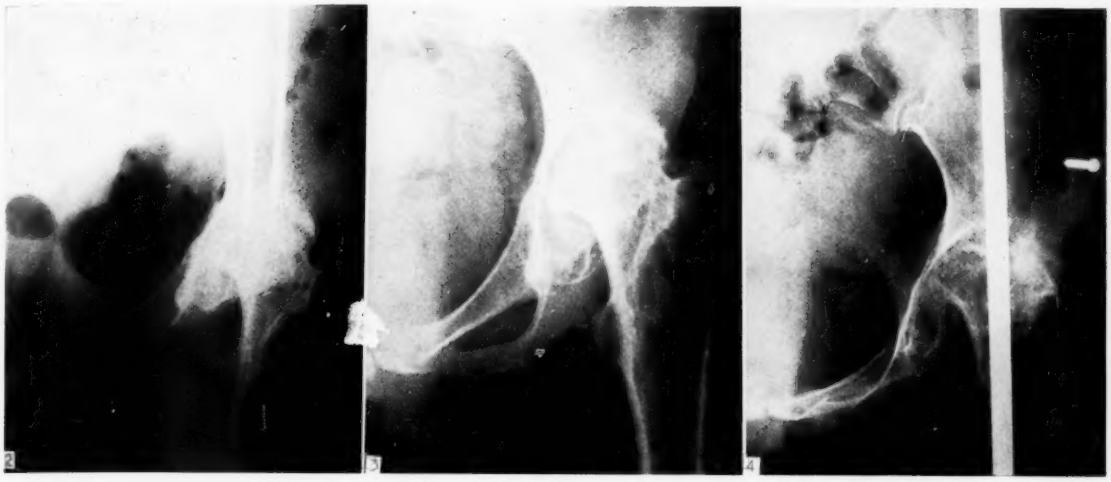

FIGURE II: Antero-posterior radiograph taken during the introduction of the guides. FIGURE III: Pre-operative radiograph of Case I. FIGURE IV: Post-operative radiograph of Case I.

FIGURE VII: Post-operative antero-posterior radiograph of hip (Case II). FIGURE VIII: Pre-operative radiograph of pelvis (Case III). FIGURE IX: Post-operative radiograph of hip (Case III).

## ILLUSTRATIONS TO THE ARTICLE BY G. S. SANTOW.

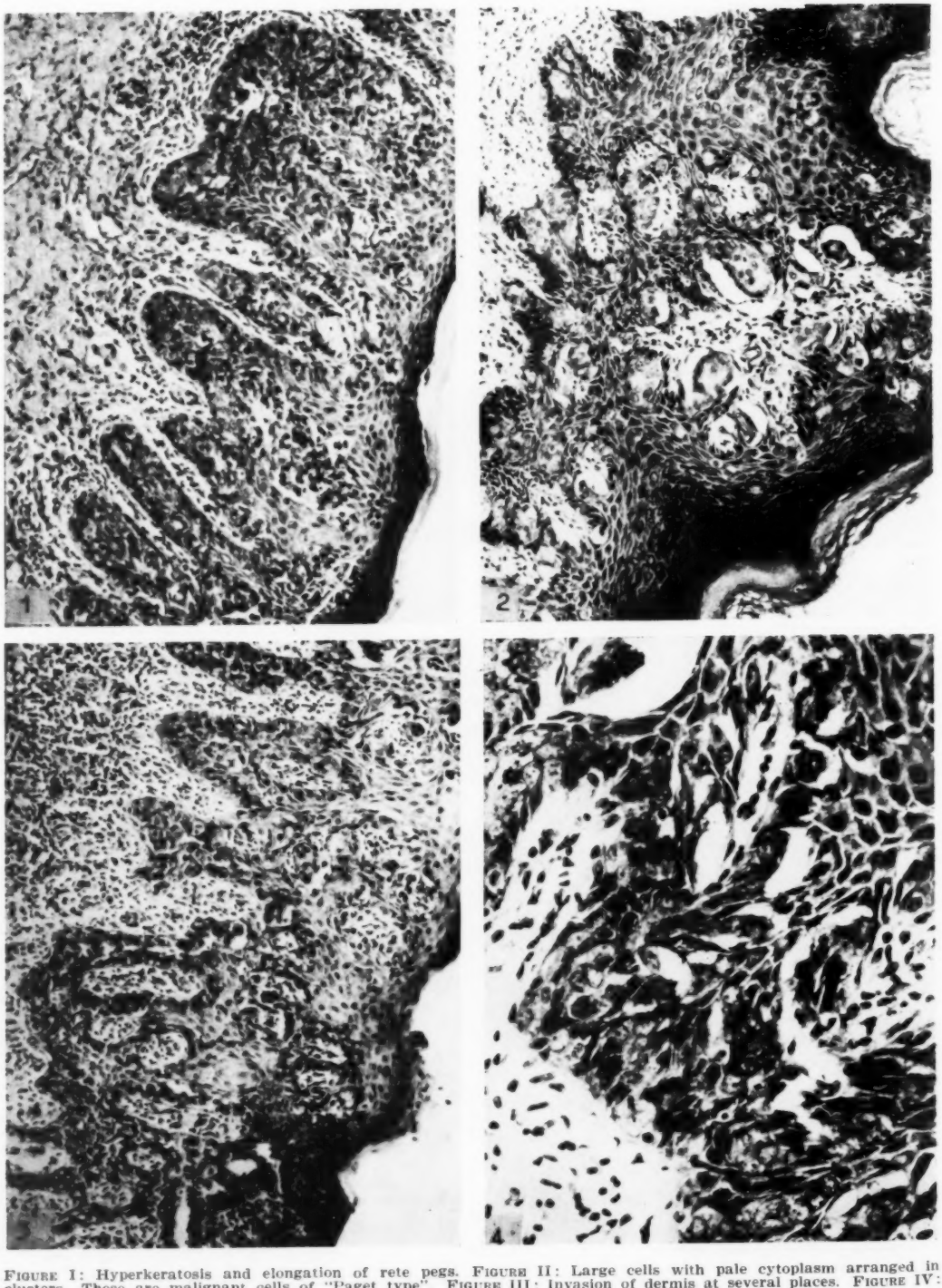

FIGURE I: Hyperkeratosis and elongation of rete pegs. FIGURE II: Large cells with pale cytoplasm arranged in clusters. These are malignant cells of "Paget type". FIGURE III: Invasion of dermis at several places. FIGURE IV: Greater enlargement of malignant cells with mitosis from the area of invasion.

TABLE III.

*Reported Cases of Parathyroid Oxyphil-Cell Hyperplasia.*

| Case. | Age. (Years.) | Sex. | Enlargement. | Predominant Cell. | Oxyphil Cells. | Lesions Found at Operation or Autopsy. |
|---|---|---|---|---|---|---|
| Magnus and Bodley Scott. | 23 | F. | Marked (three glands weighed: 5620 mg.). | Principal. | Small clumps dispersed sparsely throughout glands. | Focal glomerulo-nephritis (kidneys weighed 35 and 40 grammes respectively). Metastatic calcification of kidneys and blood vessels. |
| Smyth and Goldman | 14 | M. | All glands grossly enlarged. | Principal. | Few groups. | Kidneys each weighed 35 grammes. Marked interstitial fibrosis with hydroureter and hypertrophied trabeculated bladder. |
| Price and Davie .. | 14 | M. | Many times normal size. | Principal. | Small clumps and larger congeries. | One kidney examined showed gross reduction in size with marked fibrosis. Picture not typical of either chronic nephritis or hypertensive nephrosclerosis. Blood urea level, 318 mg. per 100 ml. |
| Crawford and La Zerte | 45 | F. | Marked (total weight of four glands: 3800 mg.). | Principal. | Numerous. | Chronic renal disease with metastatic calcification. Kidneys weighed 46 and 47 grammes respectively. |
| Herbert *et alii*.. .. | 40 | F. | Marked (total weight of four glands: 5210 mg.). | Principal. | Large accumulations of dark oxyphil cells. | Advanced renal sclerosis, but without histological evidence of chronic glomerulo-nephritis. Blood urea level, 300 mg. per 100 ml. Metastatic calcification. |
| Johnson .. .. | 34 | M. | Three glands weighed 399 mg. | Principal. | Isolated and in small clumps. | Chief-cell adenoma removed four years previously. Blood urea level then 35 mg. per 100 ml. At death, blood non-protein nitrogen level 79 mg. per 100 ml. Renal findings show substantial fibrous changes and calcification. |
| Castleman and Mallory (1935, Case 8) | 44 | F. | Solitary tumour 2·0×0·8×0·6 cm. | Principal. | Large groups. | Symptoms of hyperparathyroidism. Serum calcium level, 14·0 grammes per 100 ml.; serum inorganic phosphate level, 1·5 mg. per 100 ml. Bony changes in right renal pelvis. |
| Castleman and Mallory (1937 — Case F.L.S. 7964) | 45 | M. | Marked (4·0, 3·0, 2·0, 2·0 grammes) (approximately). | Chief cell. | Marked increase. | Metastatic calcification. Serum nonprotein nitrogen level, 120 mg. per 100 ml.; serum calcium level, 10·1 mg. per 100 ml.; serum inorganic phosphate level, 7·92 mg. per 100 ml. Severe chronic glomerulo-nephritis. Widespread calcification of arteries. Osteitis fibrosa (mild to moderate). Coronary thrombosis. |
| Pons and Papenheimer | 34 | M. | Marked (four glands weighed 3840 mg.). | Principal. | Large and small. | Cushing's disease. Advanced chronic nephritis. Metastatic calcification. Marked osteo-fibrosis of marrow. Blood urea nitrogen level, 62·8 mg. per 100 ml. |
| Nelson .. .. .. | 47 | F. | Gross hyperplasia of all four glands (4425 mg.). | 75% of cells. | 25% of cells. | Polycystic disease of liver and kidneys. |
| Gutman *et alii* .. | 60 | F., | Two enlarged. | —— | Predominated. | Polycystic disease of kidneys and liver (mild in latter). Serum calcium level, 10·2 mg. per 100 ml.; serum phosphate level, 8·4 mg. per 100 ml. |

In this same series, two subjects showed principal cell hyperplasia (Cases I and II), and one (Case I) showed a small hyperplastic focus of principal cells in one gland suggesting a small adenoma.

There were no examples of large water-clear (*Wasserhelle*) cell hyperplasia, although several subjects showed small water-clear chief cells as described by Eger and Van Lessen (1954), and three subjects showed groups of large water-clear cells—that in Case XIII being of sufficient size to designate as an adenoma.

When hyperplastic—and this important feature was present in all the above-mentioned cases—the oxyphil cells were grouped in spherical clumps (circular in cross section) within the substance of a gland as well as at the periphery (Figure I).[1] Almost without exception, these groups contained both pale and dark cells. In most cases the majority of these masses were highly vascularized, with open capillaries filled with erythrocytes.

The oxyphil cells have a curious distribution in the animal kingdom, being present only in the ox (Levine, 1928) and monkey (Tremblay and Pearse, 1959), and occasionally in the goat, horse and dog (Grau and Dellman, 1958).

Hyperplasia of the oxyphil cells has not been produced experimentally. Drake, Allbright and Castleman (1937) produced a great increase in the number of chief cells in the parathyroids of rabbits by repeated injections of a neutral buffered isotonic solution of sodium phosphate. They stated that the only significant difference lay in the lack of oxyphils in the experimental hyperplasia, and thought that this might have been due to a species difference or to the fact that the experiments were not of sufficiently long duration.

Very little information is available as to the occurrence and significance of oxyphil-cell hyperplasia in human disease. In the case of adenomas of oxyphil cells, the few cases reported show no alteration of calcium metabolism or skeletal changes characteristic of hyperparathyroidism (references given by Christie, 1955). Whilst obvious skeletal disease was excluded, serum calcium and phosphorus estimations were performed prior to death only in Case II. However, except in Case II, there was no clinical evidence to suggest hyperparathyroidism, and renal calculi were absent at autopsy in all cases.

Blumstein (1913) and Koopmann (1921) studied the degree of oxyphil-cell hyperplasia in paralysis agitans. Both found no significant increase in these cells as compared with control subjects of similar ages.

Reports in the literature are variable as to the effects of renal disease on oxyphil-cell proliferation. After examining the parathyroid glands in 20 nephritic subjects and in 20 controls of similar age groups, Radnai (1933) considered that there was a somewhat earlier appearance of oxyphil cells and in greater numbers in the nephritic cases. On the other hand, Koopmann (1921) examined the parathyroid glands in five cases of chronic renal disease, and found no histological changes which could be correlated with the renal lesions or interpreted as indicating hyperfunction or hypofunction.

Pappenheimer and Wilens (1935) reported that the oxyphil cells were no more numerous than in the control glands, and "indeed seem unusually sparse in some of the nephritic cases". None of their 27 subjects with renal lesions were reported as having pronounced renal insufficiency. However, they did mention that definite adenomas—all of the oxyphil-cell type—were found three times in the 27 nephritic cases and twice in the 72 miscellaneous non-nephritic cases. Although no comment was made by them, these figures indicate a fourfold increase for nephritic cases.

In 43 cases of bilateral renal disease, Fritz and Brines (1951) found no evidence of an increase in oxyphil cells, whereas Castleman and Mallory (1937*b*) found these cells always greatly increased in parathyroid hyperplasia secondary to chronic renal disease.

[1] For Figure I see art-paper supplement.

Table III summarizes the clinical diagnoses of reported cases in which oxyphil cells were increased in number. In all these cases there was parathyroid hyperplasia involving several glands, with the possible exception of Castleman and Mallory's Case VIII, in which only one enlarged gland (an operation specimen) was examined. Again, all subjects except this one showed advanced renal disease. Although showing only "few groups of oxyphil cells", Smyth and Goldman's case was included because groups of oxyphil cells do not normally occur in adolescence.

In the 13 cases reported above, there was histological evidence of renal disease of varying severity in eight, but in only four could it be regarded as moderately severe, and it was severe in only three cases, the eighth being described as "early nephrosclerosis". In one case the blood urea level was only 30 mg. per 100 ml. (Case XIII). The blood pressure was raised in 12 of the 13 cases. In the remaining case (XII), although the pressure was not recorded, the patient had been treated for "high blood pressure", and his heart weighed 625 grammes. Hypertension was particularly severe in the three subjects in the sixth decade, in whom the pressures were 200/130, 165/110 and 260/150 mm. of mercury respectively.

In view of the fact that in two of the few previously reported cases of oxyphil-cell adenomas the patients were obese women (Willis, 1948; Underdahl *et alii*, 1953), it is interesting to note that in the six instances in which such information as to the patient's state of nutrition was recorded, five subjects were obese and one was "emaciated".

Another interesting finding in the foregoing 13 cases is the prevalence of gall-bladder disease—in six of 11 cases in which the gall-bladder findings were recorded. Of these six subjects, four had cholesterol stones. In this respect it is of interest to note that Koopmann's (1921) youngest patient (his Case II), in his control series of subjects without paralysis agitans—namely, a female, aged 41 years, who died from carcinoma of the lung with metastases in the adrenals—also had gall-stones and numerous small and larger groups of oxyphil cells in the parathyroid glands.

In conclusion, the above-mentioned cases show that oxyphil-cell hyperplasia is not a rare phenomenon, since it occurs in about 4% of autopsies in a general hospital. Obesity, renal disease, high blood pressure and cholelithiasis, either separately or together, occurred in a high proportion of these cases, although not in all. In particular, severe renal disease was not an invariable accompanying lesion as in other reported cases.


### Acknowledgements.

I wish to thank Dr. V. J. McGovern, Royal Prince Alfred Hospital, Dr. G. S. Procopis, Lidcombe State Hospital, Dr. A. Palmer, Sydney Hospital, and Dr. J. Garven, St. Vincent's Hospital, for providing the material from which the foregoing cases were obtained. Appreciation is also expressed to Mr. J. Butterfield and Mr. R. Nunn, of the Royal Hospital for Women, Paddington, for the histological sections, and to Mr. Money, of the photographic department, Sydney Hospital, for the photomicrograph.


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## Reviews.

**Elementary Human Physiology.** By Terence A. Rogers, Ph.D.; 1961. New York, London: John Wiley & Sons, Inc. 9" × 6", pp. 428, with illustrations. Price: $6.50.

THE author has designed this book for undergraduates requiring an introduction to human physiology; but whereas it may well be ideal for a course in an American college, it has some limitations which make it unlikely to be adopted

as a university textbook for medical students, although it should prove valuable in teaching nurses, physiotherapists and others with less demanding courses.

The author aims to unify his presentation by treating the separate topics (circulation, respiration, endocrine function, etc.) as exemplifications of the general principle of homœostasis; in this he has succeeded admirably, and in particular has avoided belabouring the point. The whole treatment of the subject is adequately broad, and not excessively dogmatic. However, the author does give some strange priorities: William Harvey is relegated to the caption of an illustration, while Helmholtz holds a qualified sway over the cochlea. While the informal tone is no doubt quite appropriate in a book at this level, it is unfortunate that some of the more exotic asides (for example, those on the action of hormones and the mechanism of olfaction) are not accompanied by references. It is little assistance to those who may be teaching from the book to be told that an unorthodox hypothesis lacks critical experiment.

The references cited are mostly to articles written for *The Scientific American;* this is a good idea, as they are generally authoritative pieces by experts, even if popular in style and containing perhaps rather more speculative matter that would be found in a specialist journal. However, in this country this periodical may not be very readily available. The book itself is well made, with clear print and good illustrations on good paper, in a robust binding.

**Progress in Clinical Medicine.** Edited by Raymond Daley, M.D., F.R.C.P., and Henry Miller, M.D., F.R.C.P., D.P.M.; fourth edition; 1961. London: J. & A. Churchill Ltd. 9¼" × 6", pp. 346. Price: 50s. net (English).

THIS book has been written for the benefit of the busy clinician who is unable to keep thoroughly abreast of the current developments in general medicine, and certainly its perusal is a much lighter task than the systematic study of the unread journals lying in piles in the surgery, the waiting room and the garage.

Four editions have appeared since the original publication appeared in 1948, and each one has been completely rewritten. In each the chief recent advances in general medicine are described from a clinician's viewpoint, and the field is necessarily tremendous. In a work of this enormous scope and small size, it is inevitable that many of the doctor's questions will still be unanswered, but adequate bibliographies are given and the journals mentioned are all easily accessible.

In the fourth edition the section dealing with clinical manifestations of coronary, cerebral and renal artery disease has been extended, and for the first time space has been given to discussions of aldosteronism, psychopharmacology, autoimmunity and hypophysectomy, while the final chapter is devoted to the most readily available information regarding the physiology involved in space travel. For the rest, the scope ranges from ulcerative colitis to hyperparathyroidism and from renal transplantation to surgery of the heart.

A panel of distinguished British contributors has brought the present edition to a high standard of excellence, and it is as up to date as any such publication can hope to be.

**Keeping Fit for All Ages: Know the Game Series;** 1961. London: Educational Productions Ltd. 5½" × 8", pp. 40, with illustrations. Price: 2s. 6d. (English).

"SPORT is the cultural phenomenon of the modern age" is a true axiom, and this may account for the popularity of the "Know the Game" series of pamphlets published by Educational Productions Ltd., containing instructions on how to play various sports. This one, issued in collaboration with the Fitness Advisory Bureau, is the first publication of that body, which is an English voluntary bureau formed to give advice on and encouragement to the pursuit of fitness. The proceeds are to be given to the International Sports Trust.

At the outset one is disturbed by the challenge: "How Fit Are You?" If one has any illusions, they are forthwith shattered by the suggested tests of performance and one's resultant score. If this is not sufficient stimulus, a lengthy eulogy follows on the necessity of fitness for the enjoyment of life and the benefits it confers on practically everybody—the housewife, the executive, the sick, the well, the aged and the young. This ensures that, having read thus far, one will tackle with resolve the exercises which follow.

These form the bulk of the pamphlet and are presented pictorially. They consist of graded training routines which can be performed in all sorts of circumstances, from watching television to taking a bath. They are directed variously at the housewife, the executive and so on, and are designed to foster mobility, strength and endurance.

We believe this is a fine book if you can stand it.

**International Work in Health Statistics, 1948-1958.** By H. S. Gear, M.D., Y. Biraud, M.D., and S. Swaroop, Ph.D., M.P.H.; 1961. Geneva: World Health Organization. 9¼" × 7", pp. 56. Price: 3s. 6d. (English).

THIS book begins with a very good historical introduction to vital statistics, from the beginning of vital statistics with J. Graunt to the later development of the "International Statistical Classification". Then the need for statistics and the minimum standards required for international comparisons are discussed. Details are given of World Health Organization assistance to under-developed countries. Indeed, the number of vital statisticians in any country is necessarily so small that their education is very appropriately dealt with by an international organization. The discussion of the actual declines in mortality of recent times gives due weight to general ecological considerations. The booklet ends with sections on morbidity and measures of the standards of living. The booklet is carefully written and is easy to read. It should be read by all public-health workers, epidemiologists or anyone who hopes to measure the amount of good done by medical and hygienic procedures.

**Man and His Body: The Wonders of the Human Mechanism.** By Benjamin F. Miller, M.D., and Ruth Goode; 1961. London: Victor Gollancz Ltd. 8½" × 5½", pp. 376. Price: 29s. 9d.

SUBTITLED "The Wonders of the Human Mechanism", this book is an example of what may be termed science fantasy. Scientifically accurate and authoritatively written, it manages to invest the basic facts of physiology with all the excitement and wonder of Jules Verne. One receives a picture of the authors agape at the phenomena they describe.

Unlike most popular science, it is completely effortless to read, since all the laborious detail is skipped and exalted flights of rhetoric leaven the dull facts. Endocrine glands are "islands in the living sea", the story of sexual reproduction is "the biological love story" and vascular channels are "rivers of life'. One is taken even beyond this poetic view of the human organism and invited to see it against the background of the universe. Frequent allusions to history and pre-history relate man today with his biologically identical but technologically inferior forefathers, and speculations are made concerning his ultimate future in the cosmos.

The public will surely love this one.

**Kranz Manual of Kinesiology.** By Clem W. Thompson, Ph.D., F.A.C.S.M.; fourth edition; 1961. St. Louis: The C. V. Mosby Company. Sydney: W. Ramsay (Surgical) N.S.W. Limited. 10½" × 7½", pp. 160 with many illustrations. Price: £2 1s. 3d.

THE subject of kinesiology is one which entails an accurate and mechanically detailed study of the anatomy of the locomotor, general motor and postural systems of the body. It is essentially a study of living anatomy. No doubt the original author had these salient features in mind when he compiled his first edition in 1940. When, however, a practical work of this nature reaches its fourth edition 13 years later, the reader looks for advancements and unerring accuracy, and this degree of accuracy must be paramount in a small book whose dominant features are illustrations.

Physical educationalists have little or no access to human dissections, and whatever access they may have is to purely demonstration specimens of muscle attachments, bones and joints. Their anatomical imagination is thus largely derived from illustrations, which are but an ill-defined mirage of the real objects. It is, therefore, more than ever incumbent upon authors to provide for their books such illustrations as will produce an accurate image upon the reader's mind. It is in this degree of accuracy that this manual fails to satisfy the inquiring student of kinesiology.

If this work had dealt solely with its descriptions of muscles and the exercises in which they are involved, it would have been adequate for the purposes of mechanical anatomy, although the omission of such an important movement as opposition of the thumb resulting in the prehensile power of the human hand is to be deprecated. When, however, the book is an attempted conversion into a descriptive atlas of motor anatomy, then all the illustrations

must present a faithful reproduction of the topography of the parts. A few examples will suffice to indicate where this reproduction fails. (i) Line drawings have been confused by multiple widely-separated lines in an attempt to indicate shading, and the accessory lines bear no relation to the anatomical markings on the bones. This is particularly the case with the drawing of the right humerus on page 25, the representation of a clavicle on page 17, and the drawings of anterior and posterior aspects of the femur on page 56. Here the linea aspera appears to occupy almost the whole width of the bone. (ii) Outstanding anatomical errors in muscle attachments are to be found in the case of the Achilles tendon on page 91; the biceps femoris appears to be inserted into the femur as well as the head of the fibula on page 85; the anchorage of the patella on pages 81, 82 and 84 is non-existent, and the reader will be wondering how the quadriceps can act on the tibia, especially since we are told that a sesamoid is a "floating" bone; the brachialis on page 39 is atrophic; the pectoralis major muscle on page 29 appears to be twisted upon itself, and its origin is incorrectly marked; on page 22 the pectoralis minor is depicted as arising from four ribs, although we are told in the text that it arises from only three. These are some of the inaccuracies which must make an observant reader lose confidence in the author.

It is a pity no stress is laid upon the group action of muscles and the varieties of work that they can perform. If a discussion on the varieties of levers is considered essential, surely the work of synergists, protagonists, antagonists and fixationists should also be explained.

**Light Coagulation.** By Gerd Meyer-Schwickerath, M.D., and translated by Stephen M. Drance, M.B., F.R.C.S. (Eng.); 1960. St. Louis: The C. V. Mosby Company. Sydney: W. Ramsay (Surgical) N.S.W. Ltd. 9¾" × 6¾", pp. 114 with illustrations. Price: £5 4s. 6d.

ONE of the greatest advances in ocular therapy developed in the past 30 years is the use of light coagulation. All ophthalmologists will therefore welcome the English translation of Meyer-Schwickerath's monograph. Not only is this book a "must" for the ophthalmologist who actively uses this therapy, but it is even more necessary to the ophthalmologist who refers patients for treatment. A study of this work will dampen unwarranted enthusiasm for this therapy and so protect it from falling into disrepute.

There are indications and contraindications for its use. The technique has definite dangers. The indications, contraindications and dangers of light coagulation are clearly set out. The reader will be impressed by the honesty with which the author describes the use and results of this form of therapy, which are supported by case histories. The section on detachments of the retina and retinoblastoma are particularly instructive, and in the latter the author pays tribute to the work of Reese on the treatment of retinoblastoma with radiation and TEM.

The translation has been made by Drance; he and the publishers have produced a beautiful publication which abounds with both colour and black-and-white plates. There is a list of references to the subject, spoilt by the incorrect spelling of Flynn, whose work with Eccles on chorio-retinal burns is acknowledged. The absence of an index is compensated for by a well-documented table of contents. In spite of its relatively high cost for a small volume, this book is highly recommended.

**Essential Urology.** By Fletcher H. Colby, M.D.; fourth edition; 1961. Baltimore: The Williams & Wilkins Company; Sydney: Angus & Robertson Ltd. 9" × 6", pp. 604 with many illustrations. Price: 88s.

The fourth edition of this book embodies some structural changes from its predecessors and is 62 pages shorter. This is in part due to a reduction in the number of illustrations and thorough review of the text. The book loses little from the former, as it is still well illustrated, and the revision, based on present teaching at the Massachusetts General Hospital, is in line with present ideas.

The general set up and chapter headings remain the same, with the first 105 pages giving a clear summary of the embryology, anatomy and physiology of the genito-urinary organs. A short chapter useful to students on methods of examination follows, particular emphasis being laid on thorough history taking. The main text then deals with the individual organs, from the upper part of the urinary tract downwards. The treatment of renal infection lists all the drugs in present-day use, and is more complete than in the previous edition. Again, however, no mention is made of the insoluble sulphonamide compounds and their use in chronic pyelonephritis. It is again disappointing to see that there has been no alteration in the section dealing with benign neoplasms of the prostate. This most important section could be well expanded where it deals with symptoms, and as the book is written particularly for students and the general practitioner, more details could be given of the rectal examination and explanations for the patients' complaints. How often does the student ask: "Why does the patient have frequency?" Treatment is summarized in a table; but devotees of the Harris method of transvesical prostatectomy would not understand the disadvantages listed for this route, nor would others agree that osteitis pubis has a high incidence in the retropubic method. Residents will not find any details of pre-operative or post-operative management. The chapter on tuberculosis is excellent, and there are very useful sections on prostatic carcinoma and testicular dieases.

One can reaffirm that this is a very useful book for students; it is a sound text presented in a clear, concise manner. It should continue its popularity, particularly as its price has not risen over the past five years.

## Books Received.

*[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]*

"The Essentials of Pædiatric Surgery", by H. H. Nixon, M.A., F.R.C.S., and Barry O'Donnell, M.Ch., F.R.C.S., F.R.C.S.I.; 1961. London: William Heinemann Medical Books Ltd. 8½" × 5½", pp. 328, with illustrations. Price: 40s.

"Fundamentals of Acid-Base Regulation", by James R. Robinson, M.D., Ph.D. (Cantab.) 1961. Oxford: Blackwell Scientific Publications Ltd. 7¼" × 5", pp. 88. Price: 9s. 6d.

"The President's Review from the Rockefeller Foundation Annual Report 1960"; 1960. New York: The Rockefeller Foundation. 8½" × 5½", pp. 96, with 34 illustrations.

"Plasma Proteins in Health and Disease", Conference editor, George T. Dimopoullos, *Annals of the New York Academy of Sciences*, Volume 94, Art. 1; 1961. New York: New York Academy of Sciences. 9" × 6", pp. 336, with many illustrations. Price not stated.

"Textbook of Genito-Urinary Surgery", edited by H. P. Winsbury-White, M.B., Ch.B. (Edinburgh), F.R.C.S. (Edinburgh), F.R.C.S. (England); second edition; 1961. Edinburgh and London: E. & S. Livingstone Ltd. 9¼" × 6¾", pp. 1104, with 472 illustrations. Price: £6 10s.

"The Neuroanatomic Basis for Clinical Neurology", by Talmage L. Peele, M.D.; second edition; 1961. New York, Toronto, London: McGraw-Hill Book Company, Inc. 10" × 7", pp. 662, with many illustrations. Price not stated.

"Outline of Orthopædics", by John Crawford Adams, M.D. (London), F.R.C.S. (England); fourth edition; 1961. Edinburgh and London: E. & S. Livingstone Ltd. 8½" × 5½", pp. 456, with 324 illustrations. Price: 35s.

"Index-Catalogue of the Library of the Surgeon General's Office: National Library of Medicine", fifth series, Volume 2, subjects A-M; 1961. Washington: U.S. Department of Health, Education and Welfare, Public Health Service. 11½" × 8½", pp. 894. Price: $6.00.

"Index-Catalogue of the Library of the Surgeon General's Office: National Library of Medicine", fifth series, Volume 3, subjects N-Z; 1961. Washington: U.S. Department of Health, Education and Welfare, Public Health Service. 11½" × 8½", pp. 840. Price: $5.75.

"Clinical Chemistry: Laboratory Manual and Methods", by Joseph H. Boutwell, Jr., Ph.D., M.D.; 1961. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson Ltd. 9¼" × 6", pp. 362, with 38 illustrations. Price: 93s. 6d.

"An Introduction to Clinical Electro-Encephalography", by Robert R. Hughes, M.D., M.R.C.P.; 1961. Bristol: John Wright & Sons Ltd. 8" × 7¼", pp. 126, with 76 illustrations. Price: 30s. (English).

"Rogers' Inorganic Pharmaceutical Chemistry", by Taito O. Soine, Ph.D., and Charles O. Wilson, Ph.D.; seventh edition; 1961. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson Ltd. 9¼" × 5¾", pp. 704, with illustrations. Price: £5 10s.

The Medical Journal of Australia

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## ISOLATION OF HUMAN HEPATITIS VIRUS.

In 1956, W. A. Rightsel *et alii*[1] reported the recovery of cytopathogenic agents from the sera of individuals with infective hepatitis. These observations received critical judgement from a doubting audience hardened by years of experience in assessing similar claims concerning the ætiology of infectious disease. Doubt was cast on this attempt to establish the ætiology of infective hepatitis for two reasons: lack of confirmation from other laboratories; and the fact that the technique of tissue culture required, firstly, the use of human serum and, secondly, considerable experience in recognizing the cytopathogenic change.

In the intervening five years Rightsel and his colleagues have continued their investigations with much improved techniques and have recently published[2] an important document on the tissue culture cultivation of infective hepatitis viruses. This represents the most important advance made in the study of the disease since Findlay *et alii*[3] first suggested a virus ætiology. The virus isolates were obtained by the inoculation of human serum or plasma into a cloned strain of epithelium-like cells derived originally from the bone marrow of a patient with carcinoma of the lung (Berman *et alii*[4]). This cell line is commonly known as "Detroit-6". It is now possible to grow the Detroit-6 cells in a basal medium using fœtal calf serum instead of the human serum that was originally employed. This has eliminated many of the obvious difficulties arising from the use of human sera which could contain either virus or antibody.

The viruses isolated (representing in some instances as many as 27 tissue culture passages over a period of years) produced hepatitis in three clinical studies using human volunteers from the Illinois State Penitentiary. The results of all clinical and laboratory tests on these infected volunteers were typical of infective hepatitis. The main routes of inoculation employed were oral and intramuscular, but more consistent results were obtained with the latter route. The infective dose in tissue cultures was as high as $10^{-8.5}$ for some strains and indicated a much higher concentration of infective virus than that present in the original plasma or serum. Viruses were reisolated from volunteers experimentally infected, and specific neutralizing antibodies were also demonstrated.

Although several hundred strains of infective hepatitis virus have been isolated in Detroit-6 cells, only about 20 have been adequately studied. These detailed investigations have revealed at least three antigenic types of virus. Two types caused clinical hepatitis with jaundice. The third type has not been shown to cause illness, although inapparent infection with a consequent rise in antibody occurs. The viruses appear to be relatively heat-resistant (a temperature of 60° C. for 30 minutes is used to treat serum prior to testing for virus) and resistant to ether. Electron microscope, ultrafiltration and ultra-centrifuge studies have revealed the virus to be spherical and about 15 mμ in diameter. Thus infective hepatitis viruses rank amongst the smallest of the viruses. Similar small particles have been observed in ultra-thin sections of liver biopsy specimens from human hepatitis cases.

A neutralization test was developed for the detection of specific antibody. This showed that most volunteers developed antibody by the fifty-sixth day, although a few took more than 100 days before antibody could be detected. An interesting but disturbing observation was the repeated demonstration of both virus and antibody in the same serum. It was shown that a low level of circulating antibody did not protect against parenteral administration of virus. With obvious variation in virulence of the different strains tested, further investigation is required in order to appreciate the effect on clinical disease of (i) the size of the experimental infecting inoculum, (ii) the natural resistance of the host, (iii) the route of exposure, and (iv) the antigenic and other properties of the virus strains used.

Rightsel and his colleagues have thus opened the way for a definite and planned attack on infective hepatitis at the laboratory level. Many problems of pathogenesis and epidemiology must be solved, preferably before prevention can be attempted. Now that the technique is available, accurate diagnosis of icteric, non-icteric and subclinical infections should be possible. This is a challenge to Australian health authorities and virologists, who are well aware of the serious situation represented by 13,600 notified cases of infective hepatitis occurring in this continent in twelve months (November, 1960, to October, 1961, inclusive). The real incidence of infection may well be very much greater than this. The situation may be compared with that of poliomyelitis shortly after Enders, Weller and Robbins first demonstrated the growth of polioviruses in tissue cultures. We now have the tools for the accurate laboratory diagnosis and wide-scale epidemiological study that must accompany any attempt to prevent the disease by immunization with either a living avirulent virus or a killed one. In the case of infective hepatitis, in which the virus is apparently markedly resistant to heat and germicides, and in which avirulent strains have already been detected, a live vaccine may have some merit. One difficulty would appear to be the presence of different antigenic types varying in their ability to cause clinical disease. Again the situation is analogous to poliomyelitis, in which type 2 strains usually cause less paralytic disease than those of type 1.

[1] *Science*, 1956, 124: 226.
[2] *J. Amer. med. Assoc.*, 1961, 177: 671 (September 9).
[3] *Trans. roy. Soc. Trop. Med. Hyg.*, 1939, 32: 575.
[4] *Blood*, 1955, 10: 896.

Many problems will undoubtedly be answered within a very short while: Are the viruses isolated by Rightsel *et alii* similar to the 14 cytopathogenic agents isolated by E. V. Davis[5] from 22 Indian children with infective hepatitis? (Although Davis made his isolations in a serially transplantable cell line originating from human embryonic lung, they have properties in common with those of the Parke-Davis workers.) What is the relation between the agents of infective hepatitis and serum hepatitis? Are the infective hepatitis viruses RNA viruses, and is the nucleic acid infective *per se*? Does infection with one antigenic type offer protection against liver damage following infection with another type? What is the significance of the rhesus erythrocyte agglutination test? For how long is virus excreted in the fæces of individuals with clinical and inapparent infection?

There is an obvious challenge to Australian investigators to apply the techniques outlined by Rightsel *et alii* to the problem in this country. It is to be hoped that those individuals knowledgeable and interested in infectious disease have the time and facilities to accept this challenge.

## Comments and Abstracts.

### THE FATE OF FIELD-MARSHAL ERWIN ROMMEL.

"HISTORY is, indeed, little more than the register of the crimes, follies, and misfortunes of mankind." So wrote Gibbon in his *Decline and Fall of the Roman Empire*. Although this is certainly a pessimistic view of the matter, it contains an uncomfortable amount of truth. Amongst the most striking modern examples of "crimes, follies, and misfortunes" relating to history must undoubtedly be counted the history of the Third Reich, the rise of Adolf Hitler and the events leading up to the second World War, and the war itself. In a fascinating article entitled "On a Road in Normandy—17 July 1944", Richard A. Davis has told the story of a great German soldier, Field-Marshal Rommel;[1] his career and his death provide another illustration of the truth of Gibbon's comment.

Erwin Johannes Eugen Rommel was born in November, 1891, at Heidenheim/Brenz, Württemberg, the son of a schoolmaster and mathematician. He was one of five children, and in his childhood he was quiet and shy. However, later he became interested in ski-ing and other outdoor pursuits. He was a good student, who thought of studying engineering, but actually chose the army. He served in the first World War, and was awarded the *Pour le mérite* for a courageous operation against the Italians. Rommel was absorbed in his military work during the years of unrest, and had no interest in politics. He was a successful and intelligent instructor, but preferred to remain with the troops rather than take the opportunity of sitting for examinations for the Staff College, which would have made him eligible for the High Command. In 1939 Colonel Rommel was assigned to Hitler's military headquarters and promoted to the rank of major-general. In February, 1940, he was the commanding officer of the 7th Panzer Division; it is evident from subsequent events that Rommel never asked his troops to do anything that he would not do himself. He always commanded from a leading tank position. It is inappropriate in this place to go into the details of his distinguished war service; we are concerned with his accident and its consequences, which affected much more than Rommel personally. However, he was a soldier, and it is only fair to point out that in all his campaigns he upheld the traditions of chivalry; there is more than one story to this effect. His adventures in the Western Desert of Africa, and in the battles of Tobruk and El Alamein, caused him to be referred to by the British as "our friend Rommel" and "the Desert Fox". In his own words,[2] he "slithered" into North Africa when conditions were most unpropitious; what he achieved there is now a matter of history.

After the German and Italian defeat in North Africa, Rommel was sent to northern Italy to recuperate. In 1943 he was made Inspector of Coastal Defences of the Atlantic Wall, and later he was appointed commander of Army Group B prior to the Allied landings. Meanwhile, Hitler's changing attitude, not only his decreasing personal support of Rommel, but also his growing rigidity and blind self-sufficiency, had been affecting the field-marshal's outlook. For the first time he was becoming aware of political considerations; also, he learned from an old friend of a conspiracy to capture Hitler and oust the Nazi party. This was to be the prelude to the making of peace overtures to the Allies. The anti-Hitler movement grew, under the leadership of a number of distinguished soldiers. Rommel was convinced that the war was already lost, and his great desire was that Germany should be saved from destruction. On July 15, 1944, Rommel gave his last warning to Hitler and the High Command that the situation in France was desperate, and that the front could hold for only a matter of days. On July 20 an attempt was made on Hitler's life in East Prussia; the result was disaster. All who were remotely suspected of complicity in the plot were rounded up and executed. At this time, Field-Marshal Rommel was in Normandy. On July 17, he set out at 6 a.m. in a command car from Army Group B headquarters at La Roche Guyon, with three of his staff and a driver, to visit various command posts in the area which had been under heavy fire. At 4 p.m. they began their return journey; an important conference with the Foreign Minister, Herr von Ribbentrop, had been arranged for 8 p.m., so there was need for haste. All Rommel's daily front-line inspections were dangerous, because of the Allied straffing of the roads. This day was no exception, and on the main road from Livarot to Vimoutiers, near Sainte Foy, the car was attacked by two aircraft and hit; it raced out of control and hit a tree. One member of the staff (Captain Lang) opened a door and jumped clear, and another (Major Neuhaus) sustained a fracture of the pelvis, being hit with shell fragments; a third (Sergeant Holke) was not injured; the driver (Sergeant Daniel) was so badly injured that he died that evening. Field-Marshal Rommel was struck in the face by shattered glass and was thrown clear of the car, falling on the pavement. He sustained a severe cranio-cerebral injury, and immediately became unconscious. The story of the next few hours makes interesting reading, but cannot be given in detail. In summary, it may be stated that first aid treatment was given by the local pharmacist, Marcel Lescene, and Rommel was transferred to the Luftwaffe Hospital at Bernay, with the diagnosis of a fracture of the petrous part of the left temporal bone, a perforation of the left tympanic membrane with hæmorrhage from the left auditory canal and a fracture through the left orbital arch; the patient was in deep coma. Under specialist care supervised by Professor A. Esch, without any operative interference, he gradually recovered consciousness and made steady progress. On July 22, quite against his doctor's orders, he was found sitting fully dressed on the edge of his bed. On July 23 he was transferred to the Vésinet Hospital in Paris, and his condition continued to improve satisfactorily. There was no official announcement of the accident and of his stay in hospital, and Rommel believed that Hitler intended to blame him for the deteriorating military situation, for which, of course, he was no longer responsible. On

[5] *Science*, 1961, 133: 2059 (June 30).

[1] *Surg., Gynec. Obstet.*, 1961, 113: 243 (August).

[2] Galland, A. (1954), "The First and the Last", Methuen, London: 171.

August 1 he held a Press conference at Vésinet Hospital; it ended suddenly when he was asked whether his injury had been the result of shell fire, or had been sustained when he was thrown from the command car. Rommel, with great annoyance, saw the implication—that he was a non-combatant, and therefore not eligible for a wound decoration. On August 8 he was driven slowly back to his home at Herrlingen. His convalescence was satisfactory, and by September 6 his closed and swollen left eye was half-open. During this month the Rommel family (Frau Rommel and their son, Manfred) learned that the Gestapo was watching them, and that the field-marshal was suspected of being implicated in the bomb plot of July 20.

On October 14, Rommel was visited by General Wilhelm Burgdorff and General Ernst Maisel, ostensibly with a view to discussing a new command in Russia. The real reason of the visit was to accuse Rommel of having been a leader in the July conspiracy. He was given only about two hours to decide whether he would face a People's Court, be found guilty and hanged, or take his own life by poison. He chose the former, but was warned that his wife and son would no longer be safe if he chose to contest the charge. Their home had been surrounded, and escape was out of the question. He said good-bye to his family and his aide, Captain Hermann Aldinger, and left. Half an hour later, Frau Rommel was informed by telephone that her husband had died from a brain hæmorrhage on the way to Berlin. Captain Aldinger drove to the hospital in Ulm and identified the field-marshal; he was told that an autopsy had been forbidden by the higher authorities. With typical irony, Hitler ordered national mourning, and Rommel was given a full military funeral at Herrlingen.

Davis comments that, if Rommel had not been injured on July 17, he would almost certainly have taken the lead in organizing the Army to overthrow Hitler and the Third Reich. In Davis's opinion Rommel was the only leader who could have rallied the panic-stricken conspirators after the fiasco of July 20, and he lay unconscious at Bernay. He had realized by D-day in Normandy that Germany could not win the war, and he would have taken any bold action to save Germany and German youth from destruction. Davis also considers that Rommel's lately developed political conscience and care for his country's future might have made him a great peacetime leader. A post-script to this dramatic story appeared in *The Times* on July 20, 1961. It was reported from Bonn that on that day, the anniversary of the 1944 plot against Hitler, five barracks of the *Bundeswehr* would formally be given names of heroes of the German resistance; one of them, near Detmold, was to be named after Field-Marshal Erwin Rommel.

## THE BRACHIAL NEUROPATHIES.

AFFECTIONS of the brachial peripheral nerves, which W. A. Lishman and W. Ritchie Russell[1] have considered under the broad term of the brachial neuropathies, are diverse in their symptomatology and often obscure in their ætiology. They do not readily fall into neat groups yielding to specific treatment. All who have to deal with them will welcome the light shed on them by Lishman and Russell's study based on extensive experience at the Department of Neurology, United Oxford Hospitals. In this department during the past 15 years over 800 patients with brachial neuropathies have been treated. The policy of the department has been to study the symptoms and physical signs in each case without any particular attempt to label the condition as a syndrome, and the approach to treatment has been conservative. The present study consists of an analysis of a consecutive group of cases met with recently in the department and an assessment of the course of the disease by follow-up investigation. The cases included were all those (total 155) in which, during the period 1955-1959 inclusive, patients presented with symptoms of brachial neuropathy which they had had for more than a month. A small group of cases was excluded for reasons that need not detain us, and 146 cases remained for analysis; 95 cases were followed for over a year.

Perhaps the most important practical point that emerges is the value of conservative treatment. The methods of treatment used were based largely on the view that vigorous use of the limb is usually the chief factor in maintaining the condition and preventing recovery. Whatever else is done, according to Lishman and Russell, the limb must be rested. In many cases rest alone was advised in the first instance. The patient was told what forms of manual activity were particularly liable to aggravate the condition, and slings, splints and other means of immobilization were used as appropriate. In a few particular cases special treatment, such as injection of hydrocortisone into the carpal tunnel and decompression of the carpal ligament, was advised. No attempt was made at control in the study, but the authors report that in the majority of cases the patients were completely relieved by conservative measures, even though there had been a long history of pain before treatment.

Commenting on the history of the study of brachial neuropathy, Lishman and Russell point out that lesions situated at widely different parts along the course of the nerves have been blamed for one and the same syndrome. Time and again, they state, the demonstration of a new and convincing mechanism in a small group of cases has been followed up with enthusiasm, and treatment based on the new theory has often given enough cures to uphold that theory for a long time. As a possible reason for this situation they suggest that, in many cases, multiple factors operate together at more than one level along the course of the nerves. There is evidence to indicate the presence of a diffuse involvement of nerves along their entire course in many cases. The present study supports this hypothesis by showing the considerable clinical similarity in cases in which there is response to treatment directed at different levels, and by showing, in many cases, signs of nerve damage or sensitivity at different levels. Lishman and Russell hasten to disclaim any suggestion that "pure" examples of nerve-root, thoracic-inlet or carpal-tunnel compression do not exist. There is very strong evidence that they do, but in the cases recorded in this study there seemed to be much overlap. The importance is stressed of realizing how far the clinical signs may be misleading, and of remembering that response to treatment at one particular level does not necessarily mean that the pathological process was confined to, or even maximal at, that level. It has been shown that both pain and paræsthesiæ can be abolished by anæsthetizing a nerve distal to the lesion that caused them; it may therefore be unjustifiable to assume that, when brachial neuropathy is relieved by, say, dividing the carpal ligament at the wrist, factors proximal to this were not helping to maintain the original condition.

Lishman and Russell stress the important bearing that these findings have on treatment, in that attention should not always be focused exclusively on the part of the process which is obvious to clinical examination. This is described as being especially true in the difficult or "resistant" case, which may respond strikingly when all levels of possible irritation to nerves are borne in mind and treated. Herein apparently lies the virtue of the rest on which Lishman and Russell so much depend, in that all levels of possible irritation are dealt with by enforced rest for the whole limb—for example, by the application of an appropriate sling. They comment: "Operation on the carpal tunnel or intervertebral foramen, or removal of an abnormality at the thoracic outlet, can always be kept in reserve while simpler outpatient procedures are tried in rotation or combination." In this way, they state, the expectation of success is high.

[1] *Lancet*, 1961, 2: 941 (October 28).

The results in their series suggest that, when the optimum method of treatment has been found, its effect may be expected to persist. It is also evident that long-continued symptoms, or physical signs which indicate impaired nerve function, need not dictate more radical treatment at the outset.

In this series few operations were performed on the carpal tunnel and none on the nerve roots or thoracic inlet. Lishman and Russell express doubt whether the present enthusiasm for operating either on the carpal tunnel in Britain, or on the cervical nerve roots in the United States, will last. Certainly we must respect their statement that the results of conservative treatment are so good that they require careful assessment in relation to the effects reported after operation, and we shall hope with them that this study will form a background against which other methods of treatment can be compared.

## SHORTER ABSTRACTS.

### PÆDIATRICS.

MEASLES ENCEPHALITIS. S. Karelitz and M. Eisenberg, *Pediatrics*, 1961, 27: 811-818 (May).

THE histories of 42 patients with measles encephalitis were reviewed to evaluate the treatment, in particular to determine whether adrenal corticosteroids or adrenocorticotrophin were helpful, beyond the results with usual supportive therapy. There were no fatalities, but 13 patients had central nervous system sequelæ on discharge; 9 of these had been treated with, and 4 without, ACTH and/or corticosteroids. Reexamination of 20 of the 42 cases 2 to 7 years after discharge from the hospital revealed that of 14 children treated during the acute phase of encephalitis with ACTH and/or corticosteroids, 12 had central nervous system sequelæ, while only six of these 12 had manifested complications on discharge. Four of 6 untreated patients among the 20 followed-up had central nervous system sequelæ, as compared to 4 of 22 at the time of discharge from the hospital. The patients' condition on discharge from the hospital did not accurately indicate the future course; some sequelæ became manifest later, others disappeared, some became milder and others worse. Adrenal corticosteroids and ACTH administered to the patients did not prevent central nervous system complications. The advisability of the use of these hormones in the management of measles encephalitis is questioned by the authors. The survival of 42 consecutive patients indicates that some fatalities may be prevented by constant supervision and intensive supportive therapy. This includes correction of dehydration and electrolyte unbalance, early tracheotomy to avoid respiratory pharyngeal distress, and treatment or prevention of bacterial complications with adequate antibiotic therapy. Oxygen administration for cyanosis, impaired circulation or respiratory difficulty, the use of anticonvulsant drugs when indicated, and adequate nursing and medical attention are very important.

SAFE AND EFFECTIVE CHLORAMPHENICOL DOSAGES FOR PREMATURE INFANTS. J. E. Hodgman and L. E. Burns, *Amer. J. Dis. Child.*, 1961, 101: 140-148 (February).

INFECTIONS are a significant cause of death in premature infants and such infections are commonly due to Gram-negative, coliform bacilli which are sensitive to chloramphenicol. The toxicity of this drug in doses over 100 mg. per kilogram is well documented. The authors set out to determine the blood-level responses to intramuscular and intravenous injections of chloramphenicol sodium succinate and microcrystalline chloramphenicol in various dosages between 20 and 50 mg. per kilogram, and to discover whether the lower doses would produce therapeutic blood levels without toxicity. The blood levels were determined by a simple colorimetric method easily reproducible in a hospital laboratory. They found that infants under four days of age tended to accumulate chloramphenicol in the blood, probably owing to a decrease in tubular excretion by the kidney and a deficiency of conjugation by the liver. Initial levels were found to be lower in the case of microcrystalline chloramphenicol than with the succinate ester, and toxic reactions occurred more frequently with the former drug. They recommend, as a result of their studies, that when chloramphenicol is used for premature infants under seven days of age 25 mg. of the succinate ester per kilogram, and for older premature infants 50 mg. per kilogram, should be given once daily and the drug should be stopped if toxic reactions, such as abdominal distension, lethargy, respiratory distress and grey cyanosis appear. In cases of renal function impairment the dose should be further reduced.

THE ADVISABILITY OF PERFORMING EXCHANGE TRANSFUSION IN NEONATAL JAUNDICE OF UNKNOWN ÆTIOLOGY. Dyre Trolle, *Acta pædiat.*, 1961, 50: 392 (July).

IN a study of 1000 new-born infants, jaundice of unknown ætiology was a common finding during the first week of life. In these children the bilirubin values were as follows: more than 10 mg. per 100 ml. in 26% of full-term and 62% of premature infants; more than 20 mg. per 100 ml. in 6% of full-term and 11% of premature infants. It is known from the literature that there is a causal relationship between severe jaundice occurring in the first week of life and the subsequent development of athetosis. By carrying out exchange transfusion on children with a serum bilirubin value of more than 20 mg. per 100 ml. and comparing the number with the frequency of athetosis reported in the literature, it is shown that the following will be given exchange transfusions: (*a*) 2140 full-term babies in order to prevent subsequent athetosis in one, but there is a risk that 21 will die as a result of the procedure itself; (*b*) 92 premature infants to prevent subsequent athetosis in one, but there is a risk that four will die as a result of the procedure. The limit of 20 mg. per 100 ml. is thus not appropriate. The author concludes that through systematic investigations better criteria must be found for giving exchange transfusions to new-born infants with jaundice of unknown ætiology. On the other hand, the criteria for giving exchange transfusions to Rhesus-sensitized children are satisfactory. Although exchange transfusion is unnecessary in the case of 44 out of every 100 children, 56 will be saved from unnecessary death or kernicterus, with the risk of death due to the procedure in only one case.

VISCERAL LARVA MIGRANS. C. Harrison Snyder, *Pediatrics*, 1961, 28: 85 (July).

THE author presents an analysis of the clinical features of visceral larva migrans based on the study of 20 cases seen during a ten-year period at the Ochsner Clinic. The disease is seen in small children who eat dirt and who thus ingest the ova of the canine roundworm, *Toxocara canis*. Larvæ of the parasite invade the liver, causing hepatomegaly with extreme eosinophilia, and usually fever and anæmia. Migration of the larvæ to other organs may result in pneumonitis, encephalitis or myocarditis. Lesions may also be seen in the skin, in the kidneys and possibly in bone. Proof of diagnosis requires biopsy of liver or other infected tissue. Treatment with diethyl-carbamazine ("Hetrozan") may be helpful, but even without treatment, once pica is stopped most patients recover. Serious sequelæ are seen in the form of intraocular granulomas, sometimes causing blindness. These lesions, because they resemble retinoblastoma, have in the past led to unnecessary enucleation of the eye. Enucleation for suspected retinoblastoma, therefore, should not be performed without due consideration of the possibility of a benign granuloma caused by *T. canis*.

ERYTHROCYTE SURVIVAL IN THE NEW-BORN INFANT AND ITS RELATION TO THE POSTNATAL SERUM BILIRUBIN LEVEL. M. F. Vest and H. R. Grieder, *J. Pediat.*, 1961, 59: 194 (August).

THE authors undertook this study to determine whether increased hæmolysis after birth is a factor in the genesis of physiological icterus neonatorum. Erythrocyte destruction was followed in 33 premature and six full-term infants after autologous transfusion of red cells labelled with chromium. Simultaneously, the course and duration of elevation of serum bilirubin levels were recorded. The half-life of tagged erythrocytes varied between 14·5 and 36 days in the premature infants (average 22 days) and between 19 and 31 (average 24 days) in the full-term newborn infants. If increased hæmolysis was responsible for neonatal jaundice, one would expect that infants with a short red-cell survival would show a higher bilirubin concentration or hyperbilirubinæmia of longer duration than infants with a lower rate of erythrocyte destruction. No such relation was evident in this study.

## OTO-RHINO-LARYNGOLOGY.

RECRUITMENT AND PERSTIMULATORY FATIGUE. T. Palva, *J. Laryng.*, 1961, 75: 216 (March).

THE author reports the results of direct loudness balance tests, and of perstimulatory fatigue tests, in a series of 98 cases of unilateral perceptive deafness. It is concluded that the presence or absence of recruitment must be fitted with the general results of the otoneurological examination, and loudness balance tests alone should not be used for localizing the lesion to the end-organ or retrocochlearly. The clinical evidence in many disease groups favours this interpretation, but there are enough cases with contradictory results to deny the recruitment phenomenon the pathognomonic rôle of always indicating end-organ disease. Perstimulatory fatigue also appears in various clinical groups; while it adds to the knowledge of the ear's functional capacity, it cannot be given pathognomonic diagnostic importance. In general, it is emphasized that the audiological tests should be interpreted as a part of the otoneurological examination, and conclusions regarding the ætiology of the disease should be drawn only on the basis of a thorough clinical examination.

EARLY DIAGNOSIS OF HYDROPS OF THE LABYRINTH. R. V. Kraus, *Laryngoscope*, 1961, 71: 277 (March).

THE author states that the purpose of this paper is threefold: (i) to demonstrate that the hearing defect due to hydrops of the labyrinth can be accurately differentiated from other types of deafness; (ii) to demonstrate that defective hearing frequently is the first symptom of hydrops of the labyrinth; (iii) to emphasize the importance of early diagnosis of hydrops of the labyrinth in aviation medicine. He describes in fair detail the characteristics and qualities of the three salient features of the condition—namely, the vertigo, the tinnitus and the deafness. He mentions the loss for low tone in the early phases and the appearance of diplacusis, the pitch of a pure tone sounding higher in the diseased ear. Recruitment and a disproportionately large speech perception loss are seen. There follow some details of 14 cases, and the author notes that in only one was vertigo the first symptom. Vertigo and deafness occurred simultaneously in two cases, and in the remaining 11 cases deafness or tinnitus, whether separately or together, were the first symptoms. In some cases they occurred up to four years before the onset of the vertigo.

IDIOPATHIC HÆMATOTYMPANUM. R. D. Barton and R. Wesley Wright, *Laryngoscope*, 1961, 71: 48 (January).

THE authors refer to the obscurity of the ætiology of idiopathic hæmatotympanum. Although it was first reported 30 years ago by Shambaugh, its cause and effective treatment still remain doubtful. In the earlier reports treatment consisted of repeated myringotomies and Eustachian tube inflation. More recently mastoidectomy has been advocated, but with indifferent results. The clinical story and findings are quite definite. There is a history of earache and conductive deafness, sometimes aural discharge. The tympanic membrane is a dense, dark blue. An X-ray film of the mastoid will usually show diffuse clouding of the mastoid cells. The fluid aspirated is sterile and contains numbers of red and white cells, which suggests a hæmatogenous origin. The authors give the history of a patient with this condition who underwent a simple mastoidectomy. Hearing improved for 12 days only. Subsequently, the authors inserted a piece of polyethylene No. 90 tube through the tympanic membrane, into the middle ear cavity. They report an immediate hearing improvement which had been maintained for six months to the time of presentation of the paper. They point out the possibilities of other causes of appearance of a blue eardrum which should be disproved before insertion of the polyethylene tubing, mentioning glomus jugulare tumour, protrusion of the jugular bulb, closed head injury, hæmangioma of the middle ear, hæmorrhagic diathesis, varices of the middle ear and allergic conditions. They suggest that an exploratory permeatal tympanotomy should be performed.

NEURECTOMY IN CHRONIC VASOMOTOR RHINITIS. P. H. Golding-Wood, *J. Laryng.*, 1961, 75: 232 (March).

THE author states that the allergic theory of chronic vasomotor rhinitis is unsatisfactory. It has been notoriously difficult to identify the allergen concerned, and response to anti-allergic measures is disappointing to say the least. It is shown that the mucosal appearances of allergy and the eosinophilia can be induced purely by autonomic effects and relieved by parasympathetic section. The hypothesis is advanced that all the phenomena of chronic vasomotor rhinitis are mediated purely by parasympathetic overactivity, no matter how this may be induced. Clinical experience is presented of 43 extremely severe and otherwise resistant cases in which treatment was by petrosal or Vidian neurectomy. These operations have almost uniformly given dramatic relief. Whilst it is too early to assess the relapse rate, if any, no case of recurrence has yet been seen on the side of parasympathetic resection in a follow-up investigation extending to a maximum of four years. An unexpected bilateral response to unilateral petrosal or Vidian section is described and an explanation found. The operative methods of petrosal and Vidian neurectomy employed are briefly described and their respective merits discussed.

SYNDROME OF WAARDENBURG WITH DEAFNESS. S. Zelig, *Laryngoscope*, 1961, 71: 19 (January).

THE author presents a brief résumé of the syndrome of Waardenburg and the findings in an affected family. The main features of the syndrome are: (*a*) lateral displacement of the nasal corners of the eyes; (*b*) broad nasal bones with eyebrows meeting on the medial line; (*c*) differently coloured eyes; (*d*) a white forelock; (*e*) nerve deafness. The syndrome does not necessarily appear in complete form, but the abnormality of the eyes is considered most important. Fisch recently described a case in which a post-mortem examination was held. Absence of the organ of Corti and atrophy of the ganglion and nerve were significant findings. In the present author's case a boy, aged four years, was first seen suffering from deafness. He had all the features of the syndrome. Examination of the family revealed that the father was unaffected, but both other children and the mother show evidence of the syndrome. Waardenburg believes that the characteristic genetic traits of this syndrome are inherited dominantly.

FRONTAL BONE CONDUCTION TESTS IN CLINICAL AUDIOMETRY. C. W. Hart and R. F. Naunton, *Laryngoscope*, 1961, 71: 24 (January).

THE authors state that it has been pointed out that the mastoid process is not the best site of application for the bone-conduction receiver in threshold audiometry and that the forehead provides a better alternative. Both cochleas are stimulated more or less equally no matter where the bone conductor is applied on the skull, and the tissues in relationship to the frontal bone are more homogeneous over a reasonable area. Bárány pointed out that the cartilage of the external ear might convey sound to stimulate the cochlea, and Békésy noted that variations of only a few millimetres in the position of the bone conductor behind the ear could result in a sensitivity change of up to 10 decibels. Hence both these authorities suggest that the region of the mastoid should not be used for bone-conduction measurement. The authors have examined and compared the reliability of clinical bone-conduction tests made at the frontal and at the mastoid bones. The technique of procedure is described. They found that threshold differences were smaller when the bone-conduction measurements were made at the frontal bone. They conclude that the re-test reliability of the bone-conductor threshold tests was superior with the apparatus applied to the frontal bone rather than to the mastoid bone.

OTOMYCOSIS: A NEGLECTED DISEASE. A. E. W. Gregson and G. J. La Tombe, *J. Laryng.*, 1961, 75: 45 (January).

THE authors discuss their findings over a period of years (1956 to 1959), during which 180 patients with intractable otorrhœa were treated. The infection was either of the external auditory canal or of a radical mastoid and fenestration cavity. Of these patients, 83 had positive evidence of fungous infection and were treated with a specific fungicidal agent, with resolution of the otorrhœa. The clinical picture of fungous infection of the external ear is presented and criteria for diagnosis are given. The authors mention the inaccuracy of clinical diagnosis. The microscopic and cultural characteristics of the fungi most commonly found are described. The ætiology of fungous infection of the external ear is discussed, though it is pointed out that knowledge of this aspect is scanty. Possible methods of therapy are discussed, and the authors refer to the value of nystatin in boracic powder as a specific and successful mode of treatment.

# Brush Up Your Medicine.

## PHYSICAL SIGNS IN CLINICAL PSYCHIATRY.

THIS is meant to be a mere outline of what may be achieved by the simple but informed observation of the patient. An enormous volume of information can be thus acquired. Unless patients are physically too ill, it is much preferable to have them announced into the consulting room. There is a wealth of signs that the ambulant patient exhibits that may be missed in the patient lying quietly in bed. The very mode of entrance may be diagnostic.

Manner mirrors mood. How characteristic is the slow dejected gait of depressives, the silent diffidence and indecision that accompany even the act of seating themselves. The clicking mouth-moistener is usually an anxious or hypochondriacal depressive. What a contrast to the bouncing, affable, hand-clasping entry of the manic, whose hoarse garrulity detected from afar announces the diagnosis even before he himself arrives to confirm it! It is a curious fact that almost invariably the insistent hand shaker is manic. The suspicious patient betrays his wariness in his side-long glance, his dubious advance into the room, his backward look at the door, maybe to see that the way of retreat lies open, maybe to see that it is properly closed so that none may overhear. The patient who insists on closing the door, although it is evident that it is going to be closed anyhow, has a very great need for a closed door.

Oftentimes patients bring their own private curtains with them and immediaely drape them so that none, including the doctor, can peer within. Such patients keep their eyes continuously averted or downcast or closed. They believe the eyes are betrayers of thoughts or the medium of hypnotic domination. Others may wear heavily-tinted glasses, give some lame explanation of sensitivity to glare, and remove them upon request with evident reluctance.

Aggression is manifest in a multitude of ways short of overt expression. Deliberate bad manners are such expressions: for example, the patient who enters ostentatiously smoking; who promptly "lights up" without a "by your leave"; who contrives to keep his hat on; who talks of other doctors (and he seems to know many) in derogatory fashion, nearly always referring to them by surname only. The patient who quickly enumerates the conditions upon which she will accept treatment, the patient who insists on conducting the interview, on asking rather than answering questions, on parrying a question with a question, or who retreats into a sullen silence, is behaving aggressively. The patient who snappishly answers "You should know", early in the interview, is almost certainly delusional. The implication here is that her thoughts are not her private property or that you are part of the widespread conspiracy which is enmeshing her.

The vague, apathetic, preoccupied or faintly bewildered air of many a schizophrenic is sufficiently obvious, associated as it often is with untidiness of hair or dress. This differs completely from the dirty, dilapidated appearance of the alcoholic vagrant.

In addition to immediately recognizable conditions such as monogolism or cretinism, many mental defectives have their defect writ large in the vacant facies, naïve manner, untidy appearance, clumsiness of gait and movement, lalling speech and childish vocabulary.

Even before the patient is seated, his gait may have told much about his nervous system. One sees the *marche à petits pas* of the arteriopath, the ataxia of even early peripheral neuritis, the spastic walk of the diplegic, and occasionally the choreic incoordination of gait which makes possible an immediate diagnosis of Huntington's chorea.

Quite often one can make a spot diagnosis from an inspection of the patient's face; but, short of this, one invariably obtains vital clues to the complete picture. The alcoholic frequently has his intemperance displayed in his dissipated countenance—his flushed face, his malar telangiectases, his muddy, injected conjunctivæ with perhaps faint icteric tinge, and a little tremor of lips, tongue or head (but, if present, associated with far more obvious digital tremor). Dry, fine, brittle hair with considerable thinning, in women, strongly reminiscent of myxœdema or hypopituitarism, is far more commonly due to chronic alcoholism. Often the female alcoholic is pale rather than flushed, but this makes her spider nævi even more evident. It is worth remembering that the facial evidence of alcoholism is to some extent dependent on racial origin; fair-complexioned people are far more likely to reflect their inebriety in their faces than are dark-haired, olive-skinned people.

Recent bruises, abrasions and lacerations of face or head are often the signs of injuries sustained in a "bender", the results of either fights or falls. Much old scarring of brows, nose and forehead strongly suggests either chronic alcoholism or chronic epilepsy. When recent injuries to the face are associated with bruising of arms and wrists, the usual explanation is forcible restraint of an acutely disturbed person. It is not often these days that one sees burns round lips and chin due to the attempted or actual ingestion of caustic fluids in a suicidal attempt. The population at risk have discovered that sedative overdosage is just as effective and much more elegant and painless. There is the undoubted advantage, too, in that, if you fail, you are not left with an œsophageal stricture and a permanent gastrostomy.

The chronic alcoholic often presents with poorly-reacting, contracted and irregular pupils; but by far the commonest cause of contracted pupils in psychiatric practice these days is the almost universal use of "Largactil".

Small multiple clean sores on the face, forehead and neck are almost always due to the compulsive picking of a depressive.

The frozen facies of deep depression may be extraordinarily difficult to differentiate from the immobile countenance of Parkinsonism, but collateral signs usually give the clue. Perhaps slight head-nodding or drooling, or the suggestion of a pill-rolling tremor, points towards Parkinsonism, or a faint, almost inaudible, plaint of misery towards depression. To make matters more difficult, depression and Parkinsonism are often associated.

The emotional lability of the arteriopath is particularly characteristic. The sudden unprovoked and unfelt caricature of grief is far commoner than the opposite picture of senseless laughter. This matches the fact that real depression is four times commoner than mania in men, and eight times commoner in women.

It has often been stated that, if myxœdema is not recognized at once, it is likely to be missed altogether. The appearance is sufficiently well known, but the clue may lie rather in the hoarse voice or the dull, lethargic manner or the surfeit of clothing.

Drowsiness, in the absence of recent known sedation, may be a sign of ominous import. It may be that the patient has been surreptitiously ingesting large quantities of carbromal or bromvaletone prior to admission to hospital. A blood bromide estimation should always be done promptly. It not infrequently explains the whole present picture, but pushes the inquiry back further. Why is this person using sedatives in this way? We still see the acne of bromism, but it seems to be far less common since the organic bromide preparations have been substituted for the inorganic bromide ion. If the blood bromide level is not elevated, one immediately considers such intracranial possibilities as tumour and subdural hæmatoma. A young woman with a pre-admission diagnosis of hysteria presented with drowsiness, recent sixth-nerve palsy and mild confusion. She had marked papilloedema and her condition was an obvious neuro-surgical emergency. In this connexion one must always discover whether strabismus is recent or of long standing, and remember

that the ophthalmoscope in some circumstances is a much more important diagnostic tool than a psychometric test.

Always look well at the patient's neck. Any scars which are not where or what they should be, surgically speaking, should be inquired about. One sees at times the tell-tale scars of long past self-inflicted wounds or recent tentative scratches. It is only the deeply depressed who make even tentative assaults upon their own necks. A woman certainly will not do it unless she really means it, because she fears the cosmetic result. Any marks on the neck are worth examining carefully. There was, for example, one young woman in a convalescent ward who, examined on the day after her admission, had a faint discoloration of one side of her neck, hardly severe enough to dignify by the term "abrasion". It was about two inches long and half an inch wide. At first she denied death wishes, let alone suicidal intent; but when questioned about the mark, she burst into tears and admitted that she had, unperceived, tied a dressing-gown cord about her neck whilst in bed on the previous night. Another woman had a peculiar cruciform scar with some keloid formation just above the suprasternal notch. It was obvious that no surgeon had inflicted it and unlikely that she had. It was, in fact, the result of a homicidal attack by her husband with a bayonet years before. A third, middle-aged woman had what she claimed was a thyroidectomy scar, but it was too high and not very tidy. Asked more about it, she confessed that it was originally a self-inflicted wound, but that the thoughtful surgeon had indeed subsequently used the same scar site to perform a subtotal thyroidectomy and at the same time clean up the scar itself. He must have had a difficult time.

Another feature of the patient's clinical condition which is detectable at a glance is the general nutritional state—that is, whether the patient is over-weight or under-weight. Recent loss of weight is more surely indicated by sagging of clothes than by sagging of chin. Collars, waist bands and vests, far too large, show how much weight a man has lost since those clothes were bought. Mid-line submental sagging of skin shows the extent to which former obesity has stretched it. This should be distinguished from the finer wrinkling and lateral submental sagging due to age. Loss of weight is always a matter that must be satisfactorily explained, whether the patient is consulting the physician, the surgeon or the psychiatrist. Quite marked alterations of weight may be due to psychological causes only. Common ones are the obesity of late adolescence, especially in girls, anorexia nervosa, the mild weight loss of a considerable number of anxious patients and the extreme weight loss resembling cancerous cachexia occurring in some of the chronically severely depressed.

The chief indicators of more common specific deficiencies are glazing and fissuring at the angles of the mouth (but this can occur also in the persistent depressive lip-moistener), the smooth red atrophic mucosa of nutritional glossitis and the ataxia of peripheral neuritis. It is very seldom indeed that one sees pellagrous skin lesions in psychiatric practice in Victoria these days, and never does one see frank scurvy. Whilst inspecting the tongue, note how dry it is, having made due allowance for recent mouth-breathing in sleep and for secretion-inhibiting drugs, especially phenothiazines. Many alcoholics and senile subjects are grossly dehydrated as well as avitaminotic.

Concerning the skin of the face, the acne of bromism, the ravages of alcoholism and the changes of myxœdema have been mentioned. Other appearances of general medical or particular psychiatric importance may be the pallor of anæmia (how impossible to estimate from skin or mucous-membrane colour alone!), the cyanosis of the excessive ingester of phenacetin, obedient almost unto death to the charms of proprietary medicine advertising, and the fine, smooth, hairless skin of an adult male suffering from eunuchoidism. Sometimes one can make a psychiatric diagnosis from the complexion alone. For example, an unnatural pallor of the skin in association with a normal colour of the lips indicates long confinement of a physically healthy person to house or room, and this in turn points to schizophrenic withdrawal. The skin of the scalp and of the nape of the neck is a pretty good indicator of a patient's standards of personal cleanliness. Some lonely and neglected old people have the ingrained dirt of ages removable, as it were, only on the instalment plan, and their onychogryphosis only with a small hack-saw.

Multiple scratches on hands, wrists, forearms and legs are almost specific pointers to a frenzied dash through scrub and brambles in an attempt to avoid hallucinatory foes, practically always due to an alcoholic psychosis occurring in a bush worker or a vagrant camped in some humpy. Scabies does not seem to be nearly as common as it used to be; but any scattered papular rash, especially if it is very itchy and associated with much nocturnal scratching, and if it has continued for weeks with fresh itchy papules taking the place of older ones in spite of treatment, should always be examined carefully, preferably with a hand lens in a good light, for typical burrows. I have seen extensive and chronic "neuro-dermatitis" clear up miraculously with two applications of benzyl benzoate. Neither is pediculosis as common as it used to be, but it still occurs and is missed largely because neither doctor nor nurse has examined the patient's scalp and pubes carefully. Nobody, of course, misses the patient whose person and clothes are "crawling"; but all patients whose standards of personal hygiene are obviously low should be inspected with this in mind.

Whilst examining the patient's hair and scalp, palpate the cranium for any bony defect, either traumatic or surgical, hidden within the hair line. The depressions of burr holes indicate, according to their site, previous exhaustive neurological examination or the evacuation of a subdural hæmatoma, or a leucotomy. It is quite surprising how often patients forget to mention such major incidents in their previous medical history.

After the face, the hands reveal most. It would be true to say that at times it is possible to make a reasonably confident psychiatric diagnosis if one is permitted to inspect only the patient's hands. They reveal infallibly the state of tension. One has only to see the agitated crumpling of a handkerchief to realize how distressed a woman really is. There is the fine tremor of anxiety and hyperthyroidism, the coarser tremor of alcoholism, the alternating tremor of Parkinsonism or senility, the choreic twitching of thumb or wrist in Huntington's chorea. There is the flaccid, smooth hand of the apathetic schizophrenic, sometimes slightly swollen, blue and cold, because of the relative peripheral circulatory stasis of immobility.

Always examine the volar surfaces of wrists and forearms and the cubital fossæ for the scars of old, or the scratches or incisions of recent, self-inflicted injuries. Some epileptics have gross scarring of extremities or elsewhere due to severe burns or scalds incurred during a seizure.

The cosmetic state of a woman's hands and finger nails gives many clues to her mental condition, her occupations and her preoccupations. It is even possible at times literally to measure how long she has been mentally disturbed. Consider the woman who has previously taken great pains to care for her nails. There is lacquer on each nail, but it is in a bad state of repair. Quite a lot has rubbed off, but she has neither taken the care to renew it nor had the interest to remove it. Knowing the growth rate of nails (approximately 1 mm. every 10 days) and measuring the fresh unlaquered growth at the base of the nails, one finds, say, a growth of 4 mm, since the nails were last attended to. It is hardly hazarding a guess to infer that she has been distressed for about six weeks. Right-handedness or left-handedness is sometimes obvious from the different rates of wearing off of lacquer.

Dirty, unkempt nails may be the mark either of the slattern or of the overworked wife and mother who has long since given up the struggle to maintain her personal appearance. In the latter case, her hands confirm how hard she has worked in kitchen and house, laundry and yard. There may be the chapping of too frequent exposure

to soapy water, or the fine hair-line dirt-filled depressions on thumbs and palms of the chronic vegetable peeler.

Ruthless picking of finger nails may or may not be of much psychiatric significance. Usually it is just a plain bad habit going back to childhood; but, like most compulsive acts, it is exacerbated in periods of stress and can be reasonably under control at other times.

Tobacco staining of fingers tells stories, but different ones. The great majority of alcoholics are heavy smokers, but the converse is not true. Heavy smoking, like heavy drinking, has compulsive qualities about it. The patient, man or woman, who urgently requests to "light up" during the interview is often an alcoholic; but let us not jump to conclusions. It is even more often plain anxiety and tension quite unrelated to alcoholism. A more certain, if less frequent, sign of alcoholism is the presence of numerous little white circular or crescentic scars over the lower part of the neck or the upper part of the sternum. These are the result of small hot dobs of hot cigarette ash falling from the unheeding lips of the drinker, smoking the last cigarette in bed before lapsing into drunken slumber. Sometimes in women the stupor has been due to barbiturates rather than to alcohol.

A last important point is inspection of the palms for signs of manual toil, or the absence thereof. The latter may be even more important. A manual worker who comes with the marks of toil heavy on his hands is a sick man with a good prognosis. He is used to working hard, and he wants to get back to work. But beware of the unskilled man with the smooth hands. He has not been working and may have little intention of doing so. Of course, he may be in the grip of a compensation neurosis. He may have had a serious injury at work months ago and have been on compensation ever since. His hands have had time to lose their callouses, just as his stomach has had time to develop its alcoholic gastritis.

JOHN F. J. CADE, M.D. (Melbourne),
Psychiatrist Superintendent,
Receiving House, Royal Park,
Victoria.

# Out of the Past.

## DEATHS UNDER CHLOROFORM AT THE MELBOURNE HOSPITAL.[1]

[From the *Australasian Medical Gazette*, March, 1904.]

DEATH under chloroform at the Melbourne Hospital is a subject which has for a long time been regarded with the gravest anxiety, and with a view of making some endeavour to assist the medical staff to minimize the death rate from this cause the house committee was recently asked by the board of management to consider and report on the matter. At a recent meeting of the board, the house committee submitted the following rules for adoption: The honorary anæsthetist and the honorary assistant anæsthetist shall administer anæsthetics in the hospital. They shall attend the hospital on such days as the house committee may assign to them, and, when practicable, at such other times as their services may be required for operations. When neither the honorary anæsthetists nor an honorary assistant anæsthetist is available, the operating surgeon may appoint a member of the honorary medical and surgical staff, or one of the resident medical officers, to administer the anæsthetic, but no resident medical officer may administer chloroform unless it be in the presence and under the supervision of the honorary anæsthetist or one of the honorary assistant anæsthetists. The honorary anæsthetist shall give systematic and practical instruction in the administration of anæsthetics to the fifth year students attending the hospital, providing that students availing themselves of such instruction pay each a fee of one guinea per annum to the honorary anæsthetist. The proposed rules were sent back to the committee to be remodelled and to obtain the opinion of the medical staff concerning them.

[1] From the original in the Mitchell Library, Sydney.

# Special Correspondence.

## LONDON LETTER.

FROM OUR SPECIAL CORRESPONDENT.

### Poliomyelitis.

BY the end of June, 1961, eight out of every 10 children and adolescents under 18 years in Great Britain had been vaccinated against poliomyelitis. From 18 to 25 years, six out of every 10 had received injections. Nearly 17 million people of all ages had been given at least two doses of Salk vaccine.

Since 1957, the incidence of poliomyelitis has fallen steadily, and in 1960 the number of cases was about one-tenth of that for 1957. This autumn, however, has seen a rise in the notification rate and the appearance of an outbreak in the City of Kingston-upon-Hull, when, up to October 21, 94 cases had been notified. In view of the rapid build-up of poliomyelitis in Hull, the situation was regarded as an emergency, and it became essential to provide protection for a large number of the people of Hull (population 300,000) in the shorest possible time. For the first time in Great Britain, the oral vaccine of Sabin was used to bring the outbreak under control, and the aim was to administer one dose of the vaccine to at least 200,000 people in a few days. It was offered to all, including those who had already been fully immunized, because, though protected themselves, they could still pass the infection on to those who were not. The vaccine used contained only attenuated Type 2 poliovirus, although the epidemic strain was Type 1, and this has caused some controversy among the experts. The emergency use of oral vaccine to bar the spread of the virus in a rapidly developing outbreak is a completely different operation from routine immunization. For that purpose, the trivalent form of Sabin's vaccine, containing all three types of poliovirus, for oral administration, is available. This is being issued by the Ministry of Health on the advice of the Joint Committee on Poliomyelitis Vaccine—the Cohen Committee—for routine vaccination of all persons up to 40 years of age. The Committee state: (i) The Sabin vaccine may be used both safely and effectively for primary vaccination. (ii) Pending further study, Sabin vaccine should not be used to complete a course of vaccination with Salk vaccine. (iii) If preferred, Salk vaccine may be used as long as supplies are available.

### Influenza.

With the approach of winter, doctors are frequently asked by their patients regarding protection against influenza. Inquiries also come from industry, where sick absences lead to a break in production. Help in answering these inquiries has been given by the Chief Medical Officer of the Ministry of Health to all local medical committees and medical officers of health. The main points in the advice given are:

1. Routine immunization of all sections of the population is not recommended.

2. Routine immunization should, at the doctor's discretion, be advised for patients suffering from chronic diseases where influenza might be dangerous—for example, chronic heart, lung or renal diseases or diabetes—and expectant mothers.

3. In the event of a threat of a large epidemic such as the Asian 'flu epidemic of 1957, priority should be given to the vaccination of special groups, including nurses, doctors, hospital staffs, general practitioners, persons employed in public safety, transport and utility services and workers in essential trade and industry, but the routine immunization of these groups is not recommended.

### Immunization in Childhood.

It is well known that protection against many common infections can be given in early life, but there is much difference of opinion as to the most satisfactory timing of the various immunizing procedures. It is important that the number of injections given to the child should be as low as possible, with the least risk of complications and, in particular, of inducing provocation poliomyelitis.

The ability to form antibodies in response to an antigenic stimulus is immature at birth and may not be fully developed until about six to nine months of age. Although a useful response may be expected before that age, it may not be

maximal. Another factor which may adversely affect the ability of the infant to respond to active immunization is a high level of maternally-transmitted antibody. Vaccination against poliomyelitis, for example, is deferred until the infant is at least six months old.

The use of combined antigens requires a careful balance between them in order to prevent the response of one antigen overwhelming that of other antigens. Certain combined antigens—for example, pertussis vaccine and diphtheria toxoid—carry a small risk of provocation poliomyelitis, but this risk is likely to lessen if the present low incidence of poliomyelitis continues.

The Standing Committee of the Ministry of Health have prepared two schedules of immunization procedures for the guidance of doctors, giving the number of injections, the intervals between them and the age at which they are to be given. Primary protection against diphtheria, pertussis, poliomyelitis and tetanus is completed by the age of 21 months. Smallpox vaccination is now recommended at the age of four to five months.

### Noise in Hospitals.

The important problem of controlling noise in hospitals is the subject of a report to the Standing Nursing Advisory Committee, which the Ministry of Health has commended to hospital authorities. The Committee state that noise and inability to do anything to control or eliminate it, especially when the patient is confined to bed, may well retard his recovery.

In general, there are three main sources of noise in hospitals: external noises attributable to the situation of the hospital, noises attributable to the staff and the equipment they use, and noises attributable to the patients themselves. The noises which are most easily eliminated are those generated in the wards, ward annexes, treatment departments and corridors of a hospital in the course of its ordinary running. Suggestions are made how these noises could be reduced or eliminated. It is pointed out that much noise is caused by staff by loud talking, careless handling of equipment, failure to report equipment or fittings which have become noisy and the wearing of shoes without rubber heels. Each hospital will have its own problems, but the Committee ask that measures should be taken to make hospitals places where the patient may expect, as of right, to receive care and treatment in a calm and peaceful atmosphere, undisturbed by unnecessary noise.

### A Commonwealth Medical Service.

The President of the Royal College of Surgeons, Sir Arthur Porritt, has been appointed Chairman of a Working Party set up to consider methods by which British medicine can contribute to the progress of medical science in the developing countries. Their aim is to encourage doctors, teachers and other specialists to work overseas for a time. They will also help foreign graduates to visit Britain for further training. At first, the Working Party will be concerned with Africa, the Middle East and the Far East with the exception of Japan and China. When this work is established, the needs of Latin America will be considered. In due time, Sir Arthur Porritt hopes to establish a Commonwealth medical service.

## Correspondence.

### WANTED: DOCTORS FOR NEW GUINEA.

SIR: I was in New Guinea recently and met Bishop David Hand, one of the two Anglican Assistant Bishops. He told me of his desperate need for a doctor and I suggested writing to you. Here are the details which he hastily wrote out:

> Simbai Patrol Post and Airstrip (Madang District) in Schrader Range, altitude approx. 6,000 ft. a.s.l., head of Simbai Valley, at junction of Madang, W. Highlands and Sepik Districts, has oversight of about 10,000 people mostly pygmies. The anthropologist who has most studied them thinks they may be the aboriginal inhabitants of the country. They are a quite distinct race (with distinct culture etc.) from the Central Highlanders on the one hand and the plain or coast dwellers on the other. The area is still being brought under control—a "Restricted Area"—for which permits-to-enter must be obtained from the Government.
>
> About Easter 1960 the Anglican Mission was asked by the M.O. of the Department of Public Health in Madang to undertake medical supervision of the entire Schrader Range (i.e. Simbai Patrol District) in view of the Department's lack of staff. The offer is still open (October 1961). Board of Missions Appeals have failed to produce a volunteer.
>
> The work would include starting and supervising a small base hospital at Simbai, and patrolling on foot the mountain valleys of Simbai, Assai, and Kairouk, already dotted with Anglican Mission outstations under Papuan Teachers. The M.O. said the very first job would be the Anti-Yaws Campaign injections for these 10,000 people.
>
> The volunteer should be unmarried, young, physically A1, practising communicant of C. of E.: no other religious duties required unless he wishes. Initial period of service 3 years. Living conditions at first of the simplest. Salary nil: pocket money and keep and expenses (travelling, medical, dental, insurance premiums, etc.) provided. Contact Australian Board of Missions, 109 Cambridge St., Stanmore, N.S.W.

The New Guinea Anglican Mission is also asking for two more doctors (who could be married with families) for relatively more civilized centres. Even a *locum tenens* for a year would be a considerable help.

I assure you, Sir, the need is great. The country is just emerging from the Stone Age and is being hastened willy-nilly towards self-government. I should be glad to supply further information.

Yours, etc.,

CHARLES ELLIOTT.

341 Sandgate Road,
Nundah,
Brisbane.
November 7, 1961.

### FLUORIDATION OF PUBLIC WATER SUPPLIES.

SIR: Here are some of the facts Dr. Johnson wants me to be sure of. Perhaps he knows them.

The New York State Health Department report for 1958 gives a variation in fluoride at taps in eight fluoridated cities as 0·25 to 1·4 p.p.m. If this is the 30% to 40% variation Dr. Johnson calls permissible, it means we in the tropics will need machinery twice as accurate as New York did not have, to keep our recommended tropical level of fluoride (0·5 p.p.m.). As it is permissible to have a 40% decrease, we can save the money as long as Rockhampton water supply has 0·3 p.p.m. already, and that is the published figure. Yet there is currently a move on to fluoridate here.

Dr. Johnson is "quite positive" fluoridation as recommended is safe, although neither he nor I know of studies of delayed excretion in nephroses. Should they not be done? The World Health reference to terminal uræmia is beside the point. It is lifelong bone absorption levels, as for lead, that is the hazard in chronic fluorosis, not terminal blood levels. If only one obscure disease—Mönckeberg's sclerosis, Buerger's disease or "poker spine"—is accelerated occasionally in high fluoride areas, and as long as this possibility remains inadequately tried, fluoridation is as premature as universal vaccination (for asthmatics and all), and contrary to our dictum *primum non nocere*. The question deserves—and has never had—the research effort and honest statistical appraisal devoted to disease relationships of smoking and of food additives.

Animal experiments have not included effects over several generatons with varying mineral and other deficiencies and excesses in diet. Statistics have been interpreted in a biased way. No control studies comparing diet correction in humans have been attempted.

Kerwin's speculation *re* increased strontium deposition with high fluoride concentration is precautionary hypothesis. It can be excluded by tests, not by Brudesvold's uncompromising "It can be positively stated. . . . On issues that so deeply concern the public welfare it is essential that only factual information be considered and that concepts be based on sound principles . . . unwarranted questions . . . needlessly arousing fears . . . disservice to the public". His facts (*in toto*): From areas with fluoride in the water supply ranging from traces to 5 p.p.m. there is "no relation" between fluoride and strontium deposition. (Teeth from high fluoride areas may contain minimal strontium and *vice versa*.) He deduces from these results and some theoretical data on

solubilities that there is no relation between the presence of strontium and fluoride. Possible fallacies are ignored. The high range of fluoride figures, especially the higher concentrations, indicate high ground mineral content, not artificial fluoride, and so is likely to accompany high calcium levels. There is no correlation of calcium and fluorine effects published to my knowledge; yet here we have one for strontium and fluorine! High calcium intake should decrease strontium deposition as it does lead deposition. Dr. Brudesvold says calcium fluoride is not deposited in the tissues. This is just a red herring. The letter immediately below his quotes Gruner, McConnell and Armstrong[1] that fluorapatite, $Ca_{10}F_2(PO_4)_6$ is deposited. In this deposition the insolubility of calcium and strontium fluoride may play a part. Dr. Brudesvold implies it cannot happen because fluoride and strontium are completely soluble. Yet strontium does get deposited. So does fluorine. In their denials that calcium concentrations can affect fluoride, the pro-fluoridators not only appear to neglect the law of mass action governing ionic exchange with crystal formations, but in fact cut the very ground from their own argument that fluoride concentrations can affect apatite stability.

This issue is one where confident pre-assumptions ought to be "out". Unfortunately, they are well "in", along with platitudinous deprecations and patronizing advice to opponents.

We know millions are spent by tobacco companies to minimize belief in their carcinogenic activities. Aluminium makers cannot do this, ostensibly, to promote public action. It would be construed as bribery. Yet on Sir Stanton Hicks' figures they would stand to gain an increase of 500 times the amount of fluoride sold by adding it to public water instead of delivering the same dose when required as tablets. A United States Health Service spokesman frankly advocates non-democratic, obscurantist tactics to bulldoze through fluoridation policy. Is it just reactionary obstinacy that has made an increasing number of fluoridated cities in the United States give up fluoridation in spite of enormous expenditure of public funds to promote it? Is it coincidence that a former attorney for an aluminium combine became the American citizen responsible for such expenditure?

Floridation may do more good than harm, save more lives than it destroys. Let us prove it before we plug for it. While many eminent and careful assessors call for more tests on statistical and sound grounds, it is scientifically and politically dishonest to promote fluoridation by claiming all the facts are known. If people want to be guinea-pigs, let them do it with their eyes open for the good of the community at large, not under the guise of getting an undiluted benefit.

Most expectant mothers and weaned infants get courses of vitamins and/or minerals. In fact, the community at large swallows "vitamins galore", as one of your editorials pointed out. No one complains that they are not put into our garden water, our street-cleaning water, our bath-water and our fruit-cannery water. Fluoride ions are included in some of these peparations, pre-natal and post-natal. If it is safe in the vastly varying doses of drinking water, why the fuss about using a 500th as much fluoride in free tablets? Why not equal money and energy spent in assessing and campaigning for more apples and less refined cereal and sugar products? I can only assume money talks and gives the answer.

The National Health and Medical Research Council reported in 1953: "A properly controlled national study of water fluoridation should be instituted immediately." It has not been started.

A council set up by the American Medical Association reported in 1957: "It is too early to know what the effects of artificial fluoridation will be. . . . The method used for reporting tends to indicate exaggerated figures for improvement of decay. . . . What is reported as reduction may actually be a postponement in the recognition of decay. . . . Reasons given for believing that effects of artificially fluoridated water will be the same as those of water with natural fluoride, are not valid."

The Association of American Physicians and Surgeons, Inc., membership 15,000, in 1958 passed a resolution condemning "addition of any substance to public water supplies for the purpose of affecting the bodies or the bodily or mental functions of the consumers".

The Scientific Assemblies of France advised the Government against fluoridation after a two-years survey. The Soviet Union has not fluoridated its water.

[1] *J. biol. Chem.*, 1937, 121: 771.

The *British Medical Journal*, January 28, 1961, editorial pointed out that there was much to be learned about fluoridation, that wrong eating and hygiene habits are the probable causes of caries.

Professor D. G. Steyn, B.Sc., Dr.Med.Vet. (Pharmacol.), D.V.Sc. (Tox.), University of Pretoria, wrote "The Problem of Dental Caries and the Fluoridation of Public Water Supplies". His Dean, Professor Louw, in a foreword to this work, states: "In his typically quiet, balanced and deeply scientific manner, Professor Steyn reviews the available literature . . . three years of intensive bibliographical research." The author's conclusion is that fluoridation cannot be recommended.

Dr. P. R. N. Sutton, Senior Research Fellow, University of Melbourne, working on a scholarship under Professor A. B. P. Amies, Dean of Dentistry, came to similar conclusions, in a similar survey of the literature. The Dean agreed with his findings.

Others who warn of our incomplete knowledge are Professor Polya (Chemistry), Tasmania; Professor Sinclair (Human Nutrition), Oxford; Professor Benagiano (Dental Director), Rome.

Yours, etc.,

D. EVERINGHAM.

P.O. Box 328,
Rockhampton,
Queensland.
November 20, 1961.

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SIR: There are still some points about the suggested adding of fluoride to our water that have not been adequately considered, or at least adequately discussed.

Keeping a certain fluoride level does not ensure equal dosage; in fact, the dose would be extraordinarily unequal, for the miner and the cane-cutter may drink gallons a day, while people in a cool climate doing sedentary work may drink very little. Even children may drink a very variable amount of water, and all those living in the country and getting their drinking water from tanks would have no fluoride, so the proposed method of giving it would seem to be quite unscientific.

When it is suggested that it would be more scientific to give the desired dose in tablet or some other suitable form, propagandists of the scheme say that mothers are too careless to be bothered—a purely ex-parte statement without a shred of evidence to support it, since we have not tried it.

The assurance that no harm can come from a lifetime of fluoride intake seems to me far too cock-sure. Certainly people have for centuries been drinking water that naturally contains fluoride without serious effects; but I have read that it is the calcium salt that is present naturally, while we propose to use the sodium salt. Can it be said with certainty that it would have the same effect? I think the experiments have been far too brief for any such certainty. Probably the radiologists of the early part of the century were quite as certain that the massive doses given for exophthalmic goitre were harmless; but many women have died from carcinoma of the throat because of the long-term effects. Also, in animal experiments with continued minute doses of mildly toxic substances, it is sometimes found that ill effects are not apparent until the second generation.

Finally, if Sir C. Stanton Hicks' statement in the Journal of November 11 is correct, that opinion in America is turning strongly against fluoridation, it would surely be wise to wait a little longer.

Yours, etc.,

E. P. DARK.

Katoomba,
New South Wales.
November 22, 1961.

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SIR: Sir Stanton Hicks raises some most interesting and important questions in his letter (MED. J. AUST., November 11) on the fluoridation of public water supplies. I agree with him about basing "important social actions on argument with our fellow men", and I am sure that Mr. Krushchev also would agree with him on that point for, without it, rational social development is impossible.

As I understand the position, the Soviet health authorities have essentially the same attitude as has Sir Stanton to the problem he discusses in his letter. They do not agree with the addition of fluoride to water supplies and advocate the use of fluoride according to individual needs. Although I did not discuss this problem during several weeks' study

at first hand of Soviet health services some three years ago, I am sure this attitude to the use of fluoride would be the result of very serious and wide discussions.

This Soviet attitude does not necessarily support the case against fluoridation of Australian water supplies for at least two reasons. First, it may well be that the problem of dental caries in Soviet children is a much smaller one than with us. I think this is the case. Second, and more important, it is a relatively simple matter to provide fluoride to Soviet children on an individual-needs basis, for they all are under constant and free medical and dental supervision together with any necessary treatment. They are routinely fully examined at least twice yearly. All school-children are under daily medical care, and a large proportion of pre-school children are also under daily supervision in crèches, kindergartens and nurseries.

With us the question is whether the negative aspects of fluoridation, so well stated by Sir Stanton, are outweighed by the positive gains to be expected in the decrease in caries. We have little chance of controlling the dietary factors involved in caries production, for one thing. More important, there is no organized way in which the majority of our children can come under the frequent and expertly directed medical and dental supervision necessary for the mass application of the principle of dosage according to individual needs. Pre-school child health supervision, apart from babies, is almost negligible. During school years, the inadequacy of school medical services is surpassed only by that of school dental services. Private doctors and dentists can do something, but really very little, about the problem. The drug firms complicate matters by offering fluoride to be given in empirical dosage with or without any kind of supervision.

This is indeed a complex sociological as well as a technical problem, which certainly needs more study and discussion. On balance, I think that until such time as we develop the necessary health organization to deal properly with child health, fluoridation of water supplies, where there is at present a deficiency of natural fluoride, would be of great benefit.

Yours, etc.,

668 Torrens Road, Pennington, South Australia.
November 29, 1961.

ALAN FINGER.

## DAIRY PRODUCTS AND THE CORONARY ARTERIES.

SIR: One swallow does not make a summer, and one case history can hardly be held to prove or disprove a theory. Recently a panel of specialists warned against the risks of damage to the coronary arteries from swallowing too much milk, cream, butter and cheese.

The following history may be of some interest in this connexion. A man, aged 71, has been a lifelong milk addict, partly because he likes milk, and partly to appease the pangs of a fifty-year-old duodenal ulcer when it begins to bite. He eats liberally of butter and counts lunch a poor thing if there is no cheese on the table. For many years cream was taken daily as ordered by his physician. His coronary vessels should be a mass of cholesterol crags, and may well be so, but still he leads a reasonably active life. On the other hand, his wife never (or hardly ever) drinks milk. She is not fond of cheese, and takes the merest scrape of butter on bread. Four years ago she suffered a coronary occlusion, from which, fortunately, she has made a good recovery.

I can vouch for the accuracy of these facts, the patients concerned being my wife and myself.

Yours, etc.,

19 Beauty Point Road, Mosman.
November 16, 1961.

A. W. J. BULTEAU.

## A SOCIETY FOR YOUNG MEDICAL SCIENTISTS.

SIR: We have read with interest your editorial concerning the Australian Society for Medical Research, to be established in Sydney.

While we are in general agreement with the establishment of a medical research society, we cannot concede that a convocation consisting of a local group of young graduates in one State can be reasonably known as an Australian society. If, as your editorial appears to suggest, they seek to extend their membership throughout Australia, it would have been wiser to delay the details of a constitution and to have deferred the selection of office bearers until an attempt had been made to call a representative meeting.

May we suggest that, until this has been done, the society might call itself the Sydney Society for Medical Research?

Yours, etc.,

AUSTIN DOYLE,
BRYAN HUDSON,
ROGER MELICK.

Melbourne.
November 30, 1961.

## THE VICTORIOUS INVALID.

SIR: Your recent leading article could have mentioned another "Victorious Invalid", whose resource we greatly admired. This was de Winton Murdoch, whose battle was with an ankylosing arthritis which laid a long siege on virtually every joint, but left a spirit and dignity undamaged.

We recall the beginning in 1935, with a swollen knee and a break of nearly a year from his studies. He resumed and passed path. from the Alfred with the help of Rupert Willis, but then was lost to us for 12 years, first to the dry warmth of Mildura and later to Sydney. It was in Mildura that first he realized he had to plan for a life on crutches. He reappeared in Melbourne in 1947 as a fifth-year student. By this time he was quite rigid in every joint except those of the right arm and the hands. His ortho-pædist had offered him the choice of being a "straight man" or a "bent man". *Fortiter et recte* he chose the former, and so stood erect on his crutches through clinics and lectures, writing his notes on a stool placed on top of his desk.

When Winton graduated in 1948, practice seemed out of the question, but he felt he could succeed in psychiatry. Receiving encouragement in the clinics, he was appointed clinical assistant at the Royal Melbourne Hospital in 1949, and at the Alfred Hospital in 1952, and Specialist Psychiatrist to the Repatriation Department in 1955. He began private practice in 1950, and victory seemed complete when he flew to the United Kingdom in 1959 for post-graduate study. However, another contest soon was to begin, and after due warning, he died of a myocardial infarct on April 29, 1961, when aged 50, a "straight man" to the end.

Yours, etc.,

BRUCE ROBINSON.

14 Parliament Place,
Melbourne.
November 16, 1961.

## DENTURES FOR NECESSITOUS PERSONS.

SIR: I note in the *British Medical Association Bulletin* dated November 20, 1961, that in country areas, before a denture can be supplied to old-age, widow and invalid pensioners, a doctor's certificate is required stating that the denture is necessary "for the patient's health", and that clinical reasons should be given.

My impression of the physiology of digestion is that the first essential after ingestion is mastication and mixing with the salivary juices; this is followed by deglutition, and the stomach receives a bolus of food which has been broken down to appropriate size particles of food and well mixed with saliva. Any breakdown in this train of events must be prejudicial to health by resulting in malfunction of digestion, and the absence of adequate or of any mastication due to the lack of teeth must surely constitute such a breakdown. I fail to see, therefore, why it is necessary for a doctor to certify to the obvious; i.e., if any patient covered by the Act has no teeth or insufficient teeth, then he or she *ipso facto* requires a denture irrespective of the state of health prevailing at the time (preventive medicine is after all our ultimate goal). As to who should decide whether any patient has insufficient teeth, I suggest that this is

the function of the dentist, it being accepted as a basic incontrovertible fact that an adequate masticatory area is essential to any individual's health. In any case, I should like to advance the suggestion that "dental care" rather than just "dentures" be the aim, as simple dentistry must in many instances be able to provide adequate mastication.

Yours, etc.,

K. D. COULTHURST.

6 Cadow Street,
West Pymble,
New South Wales.
November 28, 1961.

## SHORTAGE OF DOCTORS.

SIR: Mr. Kenneth Starr's letter (MED. J. AUST., November 18) raises questions of the most far-reaching consequences.

It would be most interesting to learn from the migrating British doctors exactly why there is such an exodus of doctors from their own country. If this migration reflects dissatisfaction arising from the British National Health Service, then the public, politicians and doctors of this country ought to know about it.

The shortage of doctors, of course, is a most serious problem in country areas. The Grafton Base Hospital, with a daily average of 156 in-patients, has not had a resident medical officer in six years. As far as we know, there is not a resident medical officer on the coast between Newcastle and the Queensland border. We think that this is a scandalous situation, and that it is high time that the problems were defined and solved.

It is difficult to understand how medico-political circles can be so preoccupied with staff classifications, tissue audits and the like, and yet appear to be so untroubled by the desperate need for resident medical staff in country hospitals.

Yours, etc.,

W. T. COSTELLO,
G. DIETHELM.

Grafton,
New South Wales.
November 20, 1961.

SIR: I do not think that the shortage of doctors to which Dr. Starr refers in his letter of November 2 (your Journal, November 18, page 846) is a purely local problem. I have collected figures from various countries and have set out those for the years 1956-1960 in the table below to make this point (Table I):

TABLE I.

*Number of M.B. Graduates per 100,000 Population.*[1]

| Year | Australia | U.S.A. | Canada | U.K. |
|---|---|---|---|---|
| 1956 .. .. | 6 | 5 | 6 | 4 |
| 1957 .. .. | 5 | 4 | 6 | 4 |
| 1958 .. .. | 5 | 4 | 6 | 5 |
| 1959 .. .. | 4 | 4 | 6 | 5 |
| 1960 .. .. | 5 | 4 | 6 | Not yet obtainable. |

[1] Population from which medical students are drawn, not that into which they graduate.

These figures suggest that a relatively constant fraction of the population is available for entrance into the learned professions, and if this intellectual cream must be divided amongst the professions, an increase in one field can only be achieved at the expense of a decrease in others, unless the total volume of cream can somehow itself be considerably increased in quantity. If this analogy is pursued, we see that the dairy farmer wishing to increase his volume of marketable cream can do so by increasing the number of cows in his herd or by improving the fat content of their milk by selective breeding and scientific feeding. He can only increase the number in his herd rapidly by purchasing beasts elsewhere. The remaining avenues are slow to yield results, although almost certainly more worthwhile and more logical. However, it is doubtful whether the application of principles of controlled human breeding and feeding will ever be acceptable to the western world. It is certainly true that far more women could be recruited into the ranks of the medical profession; but the answer most probably will lie in streamlining medical services, so that what doctors we have may be more efficiently used. How many hours, for example, are wasted each day by members of the profession in travelling from home to office and office to hospital?

Certainly some reforms of a fundamental nature are urgently required; but they are required throughout the world, and not in Australia alone.

Yours, etc.,

C. S. JONES,
Associate Professor of Anæsthesia.

Department of Anæsthesia,
The University of New South Wales,
Kensington,
New South Wales.
November 22, 1961.

## QUOTABLE EXTRACTS.

SIR: Your two English sister weeklies, *The Lancet* and the *British Medical Journal*, make frequent use of quotable extracts from books, journals and speeches. These not only provide food for thought, but also frequently protect an important article from the inauspicious fate of beginning in the bottom few inches of the second column of the page before its rightful place of honour. Thus too the storage space of those who tear out and file important articles may also be conserved. I am sure that many besides myself would welcome the introduction of this system; and to set a good example, I am sending you a few snippets. Would others please copy? Since I am both a contributor of articles and an occasional reviewer of books, may I sign myself simply

Yours, etc.,

Undated. "A WELL-WISHER."

## ORAL PREMEDICATION FOR CHILDREN.

SIR: Several reports[1,2,3] have appeared over the last two years of the value of oral premedication in children, two in particular, [1,3], referring to the use of oral trimeprazine tartrate ("Vallergan") for preoperative sedation.

One of the few but real objections to this form of premedication is the occasional failure of absorption by this route. When it occurs, the child arrives at the theatre unsedated and potentially capable of vomiting a small amount of the originally hypertonic premedicant mixture diluted by gastric contents. The practice is analogous to giving oral glucose preoperatively to diabetics, and although total volumes are small, the occasional case of vomiting during induction can be embarrassing.

Early this year I was delighted, therefore, to commence a trial of "Vallergan" suppositories for rectal administration generously supplied by Messrs. May and Baker Ltd. A change of appointment unfortunately cut the trial prematurely short, but the 40 to 50 children on whom the suppositories were used gave me a fairly clear clinical impression that here was a form of premedication with a previously proven drug which was well worth bearing in mind for children of the right age group. The relevant features of these initial cases are as follows.

1. All the children came from the ear, nose and throat ward of the Adelaide Children's Hospital, and were operated on for adeno-tonsillectomy, proof puncture of the maxillary antra, or one of a variety of procedures on the ears, varying from simple myringotomy to bilateral mastoidectomy.

2. Timing. This was a matter at first of trial and error. The following scheme came to be adopted fairly rigidly: suppository one and a half hours before the scheduled time of operation; atropine by injection half an hour before operation. Operation lists rarely run accurately to time and most commonly are a little behind schedule. Therefore the patient gets his atropine injection regularly one hour after the suppository, by which time the upset occasioned by having an injection is minimized, of short duration, and only rarely was it in fact actively resented.

[1] Gunner, B. W., and Fox, B. S. O., MED. J. AUST., 1960, 1:129 (January 23).

[2] Cornish, G., and Galbraith, D., MED. J. AUST., 1960, 1:1020 (June 25).

[3] Gunner, B. W., MED. J. AUST., 1960, 2:47 (July 9).

3. Dosage—also initially a matter of trial and error. The following dosage scheme soon crystallized: weight 20 to 35 lb. (10 to 15 kg.), 50 mg. "Vallergan" suppository; 35 to 60 lb. (15 to 25 kg.), 100 mg. "Vallergan" suppository; I have found that 0·5 mg. per pound of "Vallergan" given orally (Gunner's dosage[1]) produces effective preoperative sedation subject to the limitation already mentioned. The recommended oral dose is 1 to 2 mg. per pound. Rectally, either absorption is slower or less complete, or the response is in some way altered (see below). My impression on this small number was that 2 to 3 mg. per pound (5 mg. per kg.) can be given quite safely per rectum, and that smaller doses are ineffective.

4. General impressions—from the anæsthetist's point of view, satisfactory. With the doses used, respiratory depression was not clinically detectable. Very few of the patients were drowsy or asleep on arrival at theatre—this in marked contrast to oral "Vallergan" and to most other forms of premedication. Most of them, although awake and apparently alert, were calm and cooperative, and accepted venepuncture for a thiopentone induction with unusual nonchalance. They gave a marked impression that although politely interested, they really could not care less about whatever was going to happen. One notable exception was a little child of six years having recurrent operations on both mastoids, who had had six previous operations at various stages of her life, and who came from an institution. Her earlier experiences rendered any form of premedication ineffective, and even basal anæsthesia with rectal thiopentone for subsequent dressings was a trial for all concerned.

Disadvantages: Rectal premedication is distasteful to some and a nuisance to many nurses, although they grow accustomed to giving it Some children, all over seven or eight years of age, tended actively to resent rectal premedication, and I rapidly abandoned the suppositories in this older age group. In any case, the child over 25 kg. in weight is often amenable to direct premedication by injection. After premedication the nurse has to keep an eye open for active expulsion, deliberate or otherwise, of the suppository.

Comment: It could be that this form of "Vallergan" will prove a useful addition to the range of premedicant drugs already available to the pædiatric anæsthetist. My own short and prematurely terminated experience of it suggests that it warrants a full trial.

Yours, etc.,

T. H. ALLEN.

12 Williams Avenue,
St. Morris,
South Australia.
November 22, 1961.

# Royal Australasian College of Surgeons.

## ADMISSION OF NEW FELLOWS.

THE following candidates, having satisfied the Court of Examiners, were admitted to fellowship of the Royal Australasian College of Surgeons by the Council on November 13, 1961: Douglas Barrie Berryman, Gordon James Bougher, Alan Maxwell Clarke, John Llewellyn Colvin, Henry Vernon Crock, Geoffrey Abbott Cutler, Thiruvengadasami Dorairajan, James Russell Fergusson Downie, Edward Stephen Perry Ferguson, Andrew Keith Frazer, Ian James Gordon, John Mackenzie Ham, Brian Thomas Hammond, James Dunbar Harris, Peter Francis Hart, David Frederick Hogg, Kenneth Francis Hume, John Salisbury Jose, Peter Kudelka, Hugh Simpson Millar, Ellery Arthur Mulvihill Ryan, Geoffrey Anthony Gerard Scarlett, Peter Robert Scott, John Nathan Segelov, Jack Lindsay Swann, Hugh James Tighe, Richard Murray Tooth, Arthur Brian Vivian, Ian Henderson Warner, William Wellesley Wilson.

## FACULTY OF ANÆSTHETISTS.

### Admission of New Fellows.

THE following candidates, having satisfied the Court of Examiners, were admitted to fellowship of the Faculty of Anæsthetists of the Royal Australasian College of Surgeons by the Council on November 13, 1961: John Catarinich, Nancye Eunice Edwards, John Owen Hancock, Ian Leslie Graham Hutchison, Kenneth Melville Kelly, Malcolm Ross Milne, Jean Reid Oakes, Agnes Esther Sinclair, Miriam Stafford, Robert James Sweeney, Donald John Taylor.

## FINAL FELLOWSHIP EXAMINATION.

A MEETING of the Court of Examiners for the final examination for fellowship of the Royal Australasian College of Surgeons will be held in Sydney, commencing on Friday, May 4, 1962. Candidates who desire to present themselves at this examination should apply, on the prescribed form, to the Censor-in-Chief for permission to do so, before March 22, 1962. The appropriate forms are available from the Assistant Secretary, Royal Australasian College of Surgeons, Spring Street, Melbourne, Victoria.

Candidates who have already been approved by the Censor-in-Chief, but who have not yet presented themselves for the examination, may present for this examination, provided they notify the Assistant Secretary of their intention to do so by March 22, 1962. It is stressed that entries will close on this day and late entries cannot be accepted. The examination fee is £31 10s. plus exchange on cheques drawn on banks outside Melbourne, and must be paid to the Assistant Secretary by March 22, 1962. The examination will be conducted in general surgery and in the special branches of ophthalmology, laryngo-otology, orthopædics, gynæcology and operative obstetrics, urology, thoracic surgery, neurosurgery, plastic surgery and pædiatric surgery.

At its meeting held on June 20, 1958, the Council of the College decided that candidates who possessed the fellowship of a body with which this College has reciprocity of primary examinations shall be exempted from the written part of the examination, provided that there is no relaxation of apprenticeship prerequisites.

## FACULTY OF ANÆSTHETISTS.

### Final Fellowship Examination.

A MEETING of the Court of Examiners for the final examination for fellowship of the Faculty of Anæsthetists of the Royal Australasian College of Surgeons will be held in Sydney, commencing on Friday, May 4, 1962. Candidates who desire to present themselves at this examination should apply, on the prescribed form, to the Assessor for permission to do so, before March 22, 1962. The appropriate forms are available from the Assistant Secretary of the Faculty, Royal Australasian College of Surgeons, Spring Street, Melbourne, Victoria.

Candidates who have already been approved by the Assessor, but who have not presented themselves for the examination, may present for this examination, provided that they notify the Assistant Secretary of their intention to do so by March 22, 1962. It is stressed that entries close on this day and late entries cannot be accepted.

The examination fee is £31 10s. plus exchange on cheques drawn on banks outside Melbourne, and must be paid to the Assistant Secretary by March 22, 1962. Subjects for the final examination are: (*a*) anæsthesia and analgesia, including preoperative and postoperative care; (*b*) medicine and surgery; (*c*) the application of the basic sciences, including chemistry and physics, to the specialty of anæsthetics. The examination in each case is partly written, partly oral and partly clinical (including the examination of patients).

Candidates are advised that the Primary Examination for Fellowship of the Faculty of Anæsthetists, Royal College of Surgeons of England, is reciprocal with the Primary Examination of this Faculty. Graduates of an approved medical school who have obtained, prior to December 31, 1957, the first part of the diploma in anæsthesia of an approved medical school or college, may, at the discretion of the Board, be allowed to present for the final examination for fellowship of the Faculty provided they have fulfilled all other regulations. In addition, a Board of Censors type examination will be held at the same time, and those eligible are: (i) foundation members of the Faculty of Anæsthetists of the Royal Australasian College of Surgeons, who were graduates of at least 25 years' standing on January 1, 1960; (ii) members of the Faculty of Anæsthetists of the Royal Australasian College of Surgeons who hold a two-part diploma in anæsthesia or the fellowship of the Faculty of

Anæsthetists of the Royal College of Surgeons of England; (iii) Fellows of the Faculty of Anæsthetists of the Royal College of Surgeons of England who possessed their Fellowship prior to January 1, 1960.

The conditions as outlined above in regard to the manner of entry and the examination fee also apply to the Board of Censors type examination.

# Research.

## THE NEW SOUTH WALES STATE CANCER COUNCIL.

### CANCER RESEARCH GRANTS, 1962.

THE Chairman of The New South Wales State Cancer Council, Emeritus Professor S. H. Roberts (Vice-Chancellor of the University of Sydney) has announced that the Council has approved of grants totalling £37,885 for research into cancer during 1962. Approval was given to 24 applications, as follows:

University of Sydney (£29,386): Dr. P. L. T. Ilbery, Department of Preventive Medicine; Professor C. W. Shoppee, Department of Organic Chemistry; Dr. J. K. Pollak, Department of Biochemistry; Professor C. W. Emmens, Department of Veterinary Physiology; Dr. F. H. Mills, Department of Surgery (in association with Royal Prince Alfred Hospital); Associate Professor D. A. Cameron, Department of Pathology; Professor H. R. Carne, Department of Veterinary Pathology and Bacteriology; Dr. H. L. Webster, Department of Biochemistry; Dr. K. A. O. Ellem, Department of Bacteriology; Professor F. R. Magarey, Department of Pathology; Dr. Bevan L. Reid, Department of Obstetrics; Dr. K. M. Somasundaram, Chemistry School; Dr. T. S. Reeve, Department of Surgery in association with the Royal North Shore Hospital of Sydney.

University of New South Wales (£5239): Dr. J. L. Garnett, Department of Physical Chemistry; Dr. P. S. Clezy, Department of Organic Chemistry; Dr. F. J. Moss, School of Biological Sciences; Dr. Mary H. Maguire, Department of Organic Chemistry; Dr. Elsie M. Stephenson, School of Biological Sciences.

University of New England (£900): Professor A. F. O'Farrell, Department of Zoology; Dr. P. D. F. Murray, Department of Zoology.

St. Vincent's Hospital (£343): Dr. K. A. McGarrity.

Royal College of Obstetricians and Gynæcologists (£1177).

Royal North Shore Hospital of Sydney (£300): Dr. D. W. Piper.

Royal Prince Alfred Hospital (£540): Dr. Barry G. Firkin, Clinical Research Unit.

Professor Roberts said that final consideration in respect of three other applications had been temporarily deferred, and when the desired information was available, the amount provided for research grants might possibly be increased.

# Public Health.

## POLICE OFFENCES (AMENDMENT) ACT, 1908, OF N.S.W. AS AMENDED.

THE following regulation under the *Police Offences (Amendment) Act*, 1908, of New South Wales as amended has been published in the *Government Gazette of the State of New South Wales*, No. 107, of September 29, 1961.

(9781) Chief Secretary's Department, Sydney, 29th September, 1961.

HIS Excellency the Governor, with the advice of the Executive Council, has been pleased to amend in the manner set forth hereunder the Regulations under the Police Offences (Amendment) Act, 1908, as amended.

C. A. KELLY, Chief Secretary.

The Regulations under the Police Offences (Amendment) Act, 1908, as amended, are amended by *inserting* next after Regulation 15A the following new Regulation:—

*Possession and Use of Drugs in Mines*

15B. (1) In this Regulation:—

"Approved mine" means a coal mine approved for the purposes of this Regulation by the Chief Medical Officer of the Joint Coal Board or a metalliferous mine so approved by the New South Wales Director-General of Public Health.

"Authorized person" means:—

(a) a person in charge of an approved mine; or

(b) a person employed at an approved mine who has been designated by the manager of the mine as a first-aid man, provided he is the holder of a current Third year Award in First-aid of the Government Ambulance Corps or the Medallion of the St. John Ambulance Association and has been issued with a certificate of competency by a medical officer appointed for the purpose.

(2) An authorized person is hereby authorised to procure and be in possession of morphia and morphine-like substances for installation in first-aid kits in an approved mine subject to the condition that such drugs shall be used only for emergency purposes.

(3) The first-aid kits in which such drugs are stored shall be inspected periodically by a medical officer appointed for the purpose and, when practicable, as soon as possible after a first-aid kit has been used in an emergency.

(2) An authorised person is hereby authorised to procure medical practitioner to enter or cause to be entered in a register kept solely for that purpose a record of—

(a) all supplies of morphia or morphine-like substances procured or otherwise in the possession of such authorised person:

(b) all quantities of such drugs issued by such authorised person together with information as to the places in which the drugs are to be stored:

(c) the date and place in which such drugs were used for emergency purposes and the quantity so used.

The provisions of Regulation 11 shall apply, mutatis mutandis, to and in respect of the keeping of such register.

# Medical Practice.

## NATIONAL HEALTH ACT.

THE following notice is published in the *Commonwealth of Australia Gazette*, No. 90, of November 9, 1961.

NATIONAL HEALTH ACT 1953-1961.

**Notice in Pursuance of Section 134A.**

NOTICE is hereby given that, the Medical Services Committee of Inquiry for the State of Queensland after investigation, having reported on the 24th day of July, 1961, concerning the conduct of Arnold William Wall of 34 Handford-road, Zillmere, Brisbane, Queensland, a medical practitioner, in relation to his provision of medical services under Part IV. of the National Health Act 1953-1961, I, Donald Alastair Cameron, Minister of State for Health, did on the nineteenth day of October, 1961, reprimand the said Arnold William Wall.

Dated this nineteenth day of October, 1961.

DONALD A. CAMERON, Minister of State for Health.

# Notes and News.

## Guide Dogs in Cafes.

The following interesting item appears in a recent newsletter for medical officers of health issued by the Principal Medical Officer (Public Health), Department of Public Health, South Australia:

*Entry of Guide Dogs into Cafes and Eating Houses.*

The Food and Drugs Regulation No. 12, paragraph 16, sub-paragraph b, refers to animals in places where food and drugs for sale are manufactured, prepared, packed, stored, or offered for sale. It states:

"No person shall manufacture, prepare, pack, or store any food or drug for sale or intended for sale, or offer or expose any food or drug for sale:

in any place in which any animal is permitted, or anything is or is kept, or any work is performed which is likely to contaminate such food or drug or injuriously affect its wholesomeness or cleanliness."

If a proprietor of a cafe or eating place is satisfied that any dog is a "guide" dog accompanying a blind person it is considered that he would be justified in assuming that such a dog would be unlikely to contaminate food or injuriously affect the cleanliness or wholesomeness of his premises and, in these circumstances, he would not be committing any offence under the *Food and Drugs Act* if he permitted a "guide" dog accompanied by a blind person to enter and remain on his premises.

### Booklet to Aid Obstetric Staff.

A booklet of obstetric phrases in four languages has been compiled for the use of hospital staff in maternity wards. The booklet was produced by the Migrant Information Service of the Commonwealth Savings Bank at the request of the nursing staff of a large city hospital. The obstetric terms included cover all phases from antenatal to postnatal; particular attention has been paid to terms essential for understanding in the labour wards. In the course of producing the booklet, the Bank's linguists had the cooperation of the medical profession and of the nursing staff of a leading maternity hospital. As a result, a simplified system of phonetics was adopted. The success of the phonetic system used has been proved by a series of tests under normal conditions in the labour ward. No knowledge of foreign languages is required. The essential questions and instruction are reduced to easy-to-understand syllables.

The booklet should prove a boon both to the nursing profession and to migrant mothers. In addition to the obvious advantages of effective communication, the mothers derive a good deal of comfort from the use of their own language. The psychological value of the booklet is therefore of as much importance as its practical value. The languages covered in the booklet are Italian, Greek, German and Yugoslav (Serbo-Croatian). The booklet is being distributed free to hospitals by the Migrant Information Service of the Commonwealth Bank. Copies may be obtained upon application to the Migrant Information Service.

### Portrait of Sir John Boyd.

A number of friends are planning to present Sir John Boyd, F.R.S. ("J.S.K."), with his portrait. Anyone who would like to be associated with this gift is asked to communicate with Professor G. J. Cunningham, The Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2.

### Course in Cardiac Surgery, London and Birmingham.

The British Council announces that its second course in cardiac surgery will be held in London and Birmingham on April 1 to 14, 1962. The course is designed to demonstrate to specialists from overseas both recent advances and standard practices in British cardiac surgery. Because of the close relationship between medicine and surgery in the treatment of cardiac disease, applications to attend the course are invited from cardiac surgeons and cardiologists. The course will be directed by Mr. W. P. Cleland, Surgical Sub-Dean, Brompton Hospital, London, assisted by Mr. M. Paneth, Senior Lecturer in Surgery, Institute of Diseases of the Chest, Brompton Hospital, London, and the Department of Surgery, Queen Elizabeth Hospital, Birmingham. There will be lectures, demonstrations and panel discussions as well as visits to other hospitals to see specific operations. Towards the end of the first week the course will move to Birmingham, and it will return to London early in the second week. Not more than 20 members can be admitted to the course. Further information may be obtained from the following: The British Council, 18 Greenoaks Avenue, Edgecliff, Sydney, New South Wales.

### Ninth Congress of the Pan-Pacific Surgical Association.

The Ninth Congress of the Pan-Pacific Surgical Association will be held in two parts, as follows. The first part will be held in Honolulu, Hawaii, from November 5 to 13, 1963; the second part will take the form of a mobile educational lecture seminar, and will be held from November 13

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED NOVEMBER 25, 1961.[1]

| Disease. | New South Wales. | Victoria. | Queensland. | South Australia. | Western Australia. | Tasmania. | Northern Territory. | Australian Capital Territory. | Australia. |
|---|---|---|---|---|---|---|---|---|---|
| Acute Rheumatism | 2(1) | 1 | 1 | .. | .. | .. | .. | .. | 4 |
| Amœbiasis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ancylostomiasis | .. | .. | 3 | .. | .. | .. | 1 | .. | 4 |
| Anthrax | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Bilharziasis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Brucellosis | 1 | 1 | .. | .. | .. | .. | .. | .. | 2 |
| Cholera | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Chorea (St. Vitus) | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Dengue | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Diarrhœa (Infantile) | 1 | 17(12) | 4 | .. | .. | .. | .. | .. | 22 |
| Diphtheria | 2(1) | .. | .. | .. | 1(1) | .. | .. | .. | 3 |
| Dysentery (Bacillary) | .. | .. | .. | 1(1) | 4(4) | .. | 1 | .. | 6 |
| Encephalitis | .. | 1(1) | .. | .. | .. | .. | .. | .. | 1 |
| Filariasis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Homologous Serum Jaundice | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Hydatid | 1 | .. | .. | .. | .. | .. | .. | .. | 1 |
| Infective Hepatitis | 118(41) | 80(43) | 34(12) | 33(18) | 1(1) | 12(7) | .. | 3 | 290 |
| Lead Poisoning | .. | .. | 1 | .. | .. | .. | .. | .. | 1 |
| Leprosy | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Leptospirosis | .. | .. | 1 | .. | 4(4) | .. | .. | .. | 5 |
| Malaria | .. | 1(1) | 1 | .. | .. | .. | .. | .. | 2 |
| Meningococcal Infection | .. | 2(1) | .. | .. | .. | .. | .. | .. | 2 |
| Ophthalmia | .. | .. | .. | .. | 6 | .. | .. | .. | 6 |
| Ornithosis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Paratyphoid | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Plague | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Poliomyelitis | 20(11) | .. | 8(3) | .. | .. | .. | .. | .. | 28 |
| Puerperal Fever | .. | .. | .. | .. | .. | .. | 1 | .. | 1 |
| Rubella | .. | 15(10) | 4(1) | 2(2) | 2(2) | .. | 1 | 2 | 26 |
| Salmonella Infection | .. | .. | .. | 3(3) | .. | .. | .. | .. | 3 |
| Scarlet Fever | 3 | 2(2) | 3(2) | 3(2) | 3(2) | .. | .. | .. | 14 |
| Smallpox | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Tetanus | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Trachoma | .. | .. | .. | .. | 4(1) | .. | .. | .. | 4 |
| Trichinosis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Tuberculosis | 48(27) | 10(9) | 17(8) | 3(2) | 10(8) | 1 | 1 | .. | 90 |
| Typhoid Fever | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Typhus (Flea-, Mite- and Tick-borne) | 1 | .. | .. | .. | .. | .. | .. | .. | 1 |
| Typhus (Louse-borne) | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Yellow Fever | .. | .. | .. | .. | .. | .. | .. | .. | .. |

[1] Figures in parentheses are those for the metropolitan area.

to December 10, 1963, in New Zealand, Australia, Thailand, the Philippines, Hong Kong and Japan. All physicians are cordially invited to attend both parts of these meetings. The first part of the Congress offers an extensive scientific programme by 300 leading surgeons in nine surgical specialties. The second part, the seminar through the Pacific area, offers for the first time scientific meetings in each country presenting medical material unique to the areas. Further information may be obtained from Dr. F. J. Pinkerton, Director-General, Pan-Pacific Surgical Association, Suite 570, Alexander Young Building, Honolulu 13, Hawaii.

## Australian Medical Board Proceedings.

### NEW SOUTH WALES.

THE following additions and amendments have been made to the Register of Medical Practitioners for New South Wales, according to the provisions of the *Medical Practitioners Act*, 1938 (as amended).

Registered medical practitioner who has complied with the requirements of Section 17 (3) and is registered under Section 17 (1) (*a*) of the Act: Pringle, Clive Thomas, M.B., B.S., 1958 (Univ. Melbourne).

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1) (*b*) of the Act: Chalmers, Albert Elio Ross, L.R.C.P., L.R.C.S. (Edinburgh), L.R.F.P. & S. (Glasgow), 1937; Dattner, Rene, M.B., Ch.B., 1955 (Univ. St. Andrews); Deas, Hubert Burns, M.B., B.Ch., 1950 (Univ. Witwatersrand); Gilchrist, Gerald Seymour, M.B., Ch.B., 1957 (Univ. Witwatersrand); Grove, Johannes Hendrik Maartens, M.B., B.Ch., 1941 (Univ. Witwatersrand); Lam-Po-Tang, Pierre Regis Lim-Chow, M.B., Ch.B., 1954 (Univ. Manchester), M.R.C.S. (England), L.R.C.P. (London), 1954; Marrable, Harvey John, M.B., Ch.B., 1953 (Univ. Leeds); Phillips, Geoffrey Arnold, M.R.C.S. (England), L.R.C.P. (London), 1949, M.B., B.S., 1951 (Univ. London); Rutter, Gerald Annersley, M.B., B.Ch., 1957 (Univ. Oxford); Shnier, Joseph, M.B., B.Ch., 1955 (Univ. Witwatersrand); Shulman, Sydney Solm, M.B., Ch.B., 1934 (Univ. Liverpool), F.R.C.S. (Edinburgh), 1942; Stone, Alfred, M.B., Ch.B., 1935 (Univ. Edinburgh); Stern, Edna Hilda, M.R.C.S. (England), L.R.C.P. (London), 1942, M.B., B.S., 1943 (Univ. London).

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (2B) of the Act: Juptner, Horst, M.D., 1947 (Univ. Heidelberg); Russell, Douglas Adrian, M.B., B.S., 1943 (Univ. Madras).

The following has been issued with a licence under Section 21A of the Act: Vall, Laszlo, for one year from November 21, 1961.

The following have been issued with a licence under Section 21C (4) of the Act: Selecki, Krystyna Teresa, for one year from October 11, 1961; Kainer, Yaaqov, for one year from October 6, 1961; Szmerler, Josef, for one year from October 6, 1961; Peukert, Josef, for one year from October 20, 1961; Staszkiw, Wladimir, for one year from October 31, 1961; Miller, Halina, for one year from October 6, 1961; Siroky, Nandor Ferdinand, for one year from November 26, 1961; Ropicki, Lydia, for one year from October 12, 1961; Malesevic, Bosko, for one year from November 1, 1961; Torok, Frank, for one year from October 6, 1961; Perkowicz, Irena, for one year from October 6, 1961.

The following has been issued with an interim licence: Kiss, Sarah, Division of Psychiatric Services, as from October 17, 1961.

## Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Barnard, Young Hi, M.D., 1953 (Univ. Seoul, Korea), registered under Section 17 (2A), *Medical Practitioners Act*, 1938 (as amended), D.O. R.C.P. & S. (England), 1956, St. Vincent's Hospital, Darlinghurst.

## Deaths.

THE following deaths have been announced.

HARRINGTON.—Jeffery Gould Harrington, on November 30, 1961, at Sydney, N.S.W.

FORSTER.—Wilfred Richard Forster, on December 1, 1961, at Melbourne, Victoria.

## Diary for the Month.

DECEMBER 19.—New South Wales Branch, B.M.A.: Medical Politics Committee.

DECEMBER 20.—New South Wales Branch, B.M.A.: Hospitals Committee.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

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